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N.A.A. BULLETIN

October 1959

In Three Sections
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Work Simplification **Supervisory Incentives**

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Shorter Articles on: State Tax Returns —

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The Inventory Concept of Accounting As Expressed by Electronic Data-Processing Machines and Applied to International Air Transportation

by JOHN S. WOODBRIDGE

THE INVENTORY CONCEPT of accounting is that those accounting and related control procedures which are recurring and of immense volume must be given inventory treatment in order to produce adequate and fast and inexpensive results. This inventory treatment starts with something, changes that something by adding and subtracting and multiplying and dividing and ends up with something else, with important by-products all along the line.

In international air transportation, passenger accounting and control procedures qualify for this treatment. They are recurring and of immense volume. You start with the inventory of tickets sold but not yet used (recorded in an account known as "unearned transportation revenue"), add sales for the period, subtract passenger coupons lifted and ticket refunds and transportation billed to the carrier, multiply and divide through the application of tariffs and trip-type variations and end up with the closing inventory of sold but unused transportation. The by-products embrace ticket control, the calculation and distribution of revenue, the development of charges to customers and to other airlines, detailed statistics useful down to the level of individual salesmen, traffic yields by routes and by areas and a myriad other vital statistics.

Interestingly enough, the handling and accounting for payrolls also qualify for this inventory treatment. You start with the opening inventory of people and their salaries and payroll deductions and accumulations, add people put on the payroll, subtract those who leave, adjust for other changes in payroll and related information, multiply and divide through the application of rates of pay and of related information, and end up with the closing inventory of people and of their salaries, their payroll deductions and accumulations. The important by-products embrace the mechanical issue of signed pay-checks,

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the calculation and distribution of costs, managerial statistics and the innumerable reports called for by the carrier and by those agencies interested in payroll and payroll deduction information.

Thus the inventory concept embraces three of the most pervasive accounting elements which are recurring and of immense volume, namely, those related to physical inventories, to passenger and cargo, and to payrolls.

Speed and Volume on Magnetic Tape

Demands for speed, precision and fullness of information, coupled with demands for economy, when applied to an international carrier's explosive volume, have forced it into electronic data-processing machines for accounting needs. The saturation point of records has been reached, even though the accounting has been refined and simplified almost to the dangerous minimum, and the only other alternative would be an increase in the number of tabulating machines and in space. This palliative would be completely unrealistic and the carrier would be back with the same problem in due course.

Let us dramatize one such international air carrier's present volume of work, to help visualize its coming liberation from this mass of paper work. A tabulating machine card is considered as having been "machined" every time a machine operation is performed on it. Last year this company "machined" one and one-half billion cards, each 7 and ⅜ inches long. This number of cards, laid end to end, would reach around the equator six times. One of the new jet transports idling along at 550 miles an hour would have to fly continuously for 13 days and 13 nights, refueling in the air, just to pass over this card work of a single year.

The secret of this coming release from bondage and of the company's newly-acquired gift of limitless vision by means electronic data-processing machines is to be its emancipation from the present enforced slowness of introduction of basic data into the machines and the still greater tediousness of issuance of new data after processing. Tabulating machine cards containing eighty or ninety fields of information are presently processed at an average rate of 250 in a minute; the same type of information is now to be processed at a rate equivalent to 8,000 cards in a minute, 32 times as fast.

This metamorphosis results from relegating the tabulating-machine cards to second place by transcribing the data on them, quietly and independently and inexpensively and mechanically at the dead of night to magnetic tape, which then becomes the medium of input into the machines as well as the medium of output from the machines. A tape, 2,400 feet long and two and

a quarter pounds in weight, containing data equivalent to that in 5,000,000 characters in over 60,000 cards completely filled in, passes this data to the previously-instructed central processing unit in six and a quarter minutes, the rearranged results emerging at the same time and in the same time on other magnetic tapes.

The magnetic tapes are extraordinary objects. A tape full of data looks like one that is blank, for the data transcribed on it is by way of the presence or absence of invisible magnetized spots, and not of visible marks. The "binary" system is used, under which combinations within four horizontal channels reserved for magnetized spots represent the digits, combinations within two more channels represent the letters of the alphabet together with certain symbols, and the last of the seven channels contains the positive or negative item balancing control. These combinations within the perpendicular of the seven channels running horizontally on the tape thus reflect the single digits and letters entering into the permutations and combinations.

A Look at Passenger Revenue Accounting

Let us now apply this newly-found emancipation to a matter of universal interest to those in the long-range transportation field. Every five seconds of every working day, one of this carrier's tickets is sold somewhere in the world, for travel somewhere in the world to somewhere else in the world. These tickets are not ordinary little stubs covering travel over a relatively short distance over the lines of a single air carrier but contain intricate flight coupons, frequently with multiple legs and over the lines of many other air carriers, each of which flight coupons must be kept under rigid control because of its negotiability and because of its revenue distribution requirements. In some cases, there have been as many as fifty flight coupons within a single ticket.

To control this immense volume in an orderly and inexpensive manner, all sales are passed to a control account, "unearned transportation revenue", the detail being maintained on tabulating machine cards, one card for each flight coupon of each ticket—again an inventory concept. Because of the multiplicity of flight coupons per ticket, each two sales have been averaging five tabulating machine cards. Usage of the flight coupons anywhere in the world is reported to the revenue accounting office through the passage flight envelope and the accompanying lifted flight coupons, through the refund reports and the accompanying refunded flight coupons and through the billings from other carriers and the accompanying flight coupons lifted by those carriers. This usage relieves the inventory of unearned transportation revenue, the usage being

translated to tabulating cards to reduce the inventory, the remainder being constantly under tabulating card control.

The sorting, merging, matching and computation presently consume about 750 hours of machine time each month. The electronic data-processing machines are expected to do the same job in 15 hours. The total passenger revenue job, now requiring over 4,000 hours of machine time each month, should then be done in 125 machine-hours. The present inventory of unearned transportation revenue is contained in almost 400 tightly-packed trays of tabulating machine cards; the equivalent data is to be contained on 10 reels of magnetic tape. To see more clearly the manner is which this is done, let us peer through the picture window of this new electronic data-processing machine room and see what it is all about. We will look first at the input of an over-simplified illustration within passenger revenue accounting.

The central processing unit's memory, is first readied by introducing the predetermined instructions into it automatically and with extreme rapidity by a file of tabulating machine cards containing the programs. These instructions fix directional electronic channels within the apparatus, ready to analyze the diverse elements about to be introduced. Each channel is thereupon prepared to attract the coming data within its selected elements, to accumulate, combine and re-arrange such data and, finally, to produce the desired results within its particular sphere of activity.

There will already have been placed on different reels of magnetic tapes the vital statistics as to each ticket sold, as to each ticket lifted through carriage of the passenger, as to each ticket lifted through refund and as to each ticket charged by other carriers, as well as information as to each ticket previously sold which has not yet been lifted or refunded. Five tape-unit machines feed the data from the respective tapes into the central processing unit. The first magnetic tape contains the opening inventory of tickets sold but not yet used, the unearned transportation revenue. The second tape contains the sales for the period under review. The third tape contains passenger lifts. The fourth tape contains the billings by other airlines for their passenger lifts of sales made by this carrier. The fifth tape contains refunds.

The central processing unit, operating under the predetermined instructions, keeps selecting the lowest-numbered ticket data from whichever magnetic tape contains it, processes as it selects in accordance with the instructions, and places the re-arranged data on other magnetic tapes in five other tape-units. The first resulting tape contains the new inventory, the new unearned transportation revenue. The second tape contains the matched lifts, thus a revenue and a control item. The third tape contains the matched refunds, thus a control item.

The fourth tape contains charges to other airlines, a highly current asset collectible generally through the media of the Clearing House of the International Air Transport Association and of the Airlines Clearing House in the United States, and a statistical item. A fifth tape is used, if indicated, to contain unmatched lifts and refunds, a further revenue and control item and occasion for detailed review. If the volume is not high, this tape can be replaced by an electric typewriter connected to the central processing unit and operating when its type of data turns up.

The airlines of the world do hundreds of millions of dollars of interline traffic business with each other each year. One airline lifts a flight coupon sold and issued by another airline, carefully scrutinizes and audits it, prices it in accordance with prevailing rules, regulations and tariffs and finally prepares an invoice to the issuing airline which, in turn, examines the invoice and audits the same coupon to make sure that the charge is in order. In the future, statistical techniques generally employed in sampling random data can be applied impartially by the machine to this type of interline accounting. In this fashion, only a small fraction of documents will have to be priced and verified manually, since the amounts manually developed for the sampling data will be electronically projected over the entire area of documents concerned.

Wasting No Milli-Seconds: Printing Out

The machine is inherently lazy, since it has absolutely no initiative and operates only upon explicit instruction. Since its operations are performed in thousandths of a second, occasionally the lacing and continuity allow gaps of a few milli-seconds here and a few milli-seconds there to occur. Rather than waste these occasional milli-seconds, a completely different topic can be handled at the same time as the topic being developed, which will utilize these stray milli-seconds with resulting tape answers. Thus it can activate a payroll topic at the same time that the ticket accounting is being performed and thereby help keep the machine from turning into a loafer.

Where it is necessary or advisable to reflect any of the final data in print, the tape selected is removed from the central processing unit and connected directly to a high-speed printer. Printing four items to a line, this printing machine will print 4,000 items in one minute, almost a quarter of a million items in one hour.

Where it is considered advisable to translate the tape data to tabulating machine cards, that also can be done independently of the central processing unit,

at the rate of 6,000 in an hour. Payroll checks can readily be printed on tabulating machine cards receiving their information directly from tape.

On the present machines, information selected from a passenger ticket or cargo air waybill has been confined to the relatively few columnar fields of a columnar tabulating machine card. With magnetic tape, information covering tickets or air waybills, basic salary information or payroll deductions, statistics or other vital data can be recorded without such a limit. Thereafter, kaleidoscopic treatment can be applied to the data on the tape to obtain endless patterns and varieties of desired information.

Expanded Help to the Airline's Sales Department

This carrier's management feels that the new accounting mechanisms will qualify them even more to be considered as an indispensable arm of the sales department. On the one hand, the accounting staff does its best to satisfy customers, making it a point to make refunds as speedily as possible and to pay for c.o.d. shipments from New York in dollars as soon as advised of collection at destination (even though the collection has been in a foreign currency). Insurance claims are handled justly and rapidly. These new machines will keep the information scrupulously up-to-date.

On the other hand, the sales force is provided with tools to help show where business lies, in such form that sales staff can focus their magnetic personalities on prospects without wasting time. There are far-reaching plans of direct expanded assistance from the new machines. The carrier issues lists of sales by month, by point of sale, by operating division and by individual agent and, as far as the other airlines of the world are concerned, by and for each airline at each point of sale. It issues special traffic studies from time to time, as called for, to help develop projects that the sales force is working on. It is building refined data on the transportation of commodities. The development of cargo is a "must" and carrier management plans to be able to help develop it fast and efficiently, by indicating the products and source and shippers and consignee, and geographical areas which desperately need airline services.

But this is not enough. The revenue capacity is being increased every time another airplane is received, and they are coming thick and fast. This revenue capacity must be sold. Picture, if you will, a cargo salesman being able authoritatively to advise a potential customer that there is a ready market for his goods in an area of the world with which the customer is not familiar. Imagine a salesman being armed with the latest information enabling him to promote the business that produces the most revenue and also thus being able to aid the

customer by being sufficiently informed to acquaint him with more data about certain areas of his business than he perhaps knows himself.

This is illustrative of the type of ammunition that this international air carrier plans to supply its salesmen of the near future by means of the electronic data-processing machines. Some of the reports that are being developed now include:

1. A report of business derived from individual shippers in the United States. This would include, as to each shipper, the sales area, the destination area, the weight, the number of shipments, the revenue, and probably the type of commodity.
2. A report of cargo commodities by carrying divisions of the company. This would list thirty all-inclusive, separate, major commodity classifications, summarized into sales origin, the carrier's on-line origin and on-line destination, by weight, number of shipments and total revenue.
3. A report of weight brackets, by carrying divisions of the company. This would show the weight, the number of shipments and the revenue earned by divisions, separated into weight brackets of 50 pounds from 1 to 100 pounds, 100-pound brackets to 1,000 pounds, 500-pound brackets to 4,000 pounds, 1,000-pound brackets to 7,000 pounds, and details of all over 7,000 pounds. This would be useful in determining the type of shipment that produces the most revenue, the type needed to produce more revenue, the type readily carried by the existing flight equipment during peak and low seasons, and future rates as to the several weight brackets.

A Fascinating Future

This discussion has been addressed principally toward revenue and statistical applications, because it is in these areas that the volume of detail has become particularly stifling. But, as these areas become less critical, practical value will be gained from the thousands of concentrated hours of detailed planning on other applications which are being studied concurrently with the planning for the first applications. Payrolls are recurring and intricate and of considerable volume, so the handling and accounting for payrolls will be accorded the inventory treatment so admirably executed by the electronic data-processing machines. The accounting for the acquisition, disposition and existence of spare parts, materials and supplies is another of the most pervasive accounting elements which are recurring and of immense volume. The electronic data-processing machines are hungry for this type of activity; through their speed

and uncanny capacity for exposing other facets of information not hitherto economically available to produce, they should create direct savings in amounts purchased through disclosing numerical and geographical saturation areas with re-order periods lengthened accordingly. Commitment accounting becomes far more facile to arrange and delivery schedules can be more readily displayed to interested technicians.

The use of transceivers will add immeasurably to the potentials of electronic data-processing machines. Transceivers are machines which permit the duplication of tabulating machine cards from a distance through the use of telephone and telegraph circuits. Place 35,000 tabulating machine cards in four transceivers attached to a single telephone line at six o'clock in the evening and at eight o'clock next morning, fourteen hours later, a complete duplicate set of cards has been reproduced at the office 3,000 miles away, through the medium of its transceivers there. The potentials of this medium of accurate and speedy information transfer stagger the imagination.

The matter of instructing the machine as to the different applications is enormously difficult. Since the machine obeys implicitly but cannot think, the instructions must be in the language of the machine, which language has been reduced scientifically as to processes and "addresses" within the machine. This language, worked out patiently and painstakingly and with infinite attention to detail of logic diagramming and programming, is converted from the final instruction codes to tabulating machine cards, and is understood thoroughly by the technicians, who must be able to apply the knowledge absolutely accurately, or else chaos would result. Some programs contain as many as 2,500 instructions. The passenger revenue programs previously discussed will probably have as many as 50,000 instructions. Fortunately, these programs can be proven on the machine prior to their being put into operation; once perfected and laced in with related programs, they can be set aside for subsequent use, with the certainty that they are standing by for orders, ready, willing and able to obey.

Thus this company is meeting head on the challenge of the requirements for faster and more essential vital data without increasing production cost, by changing the bed of its stream of accounting and statistics and controls and thereby handling the increased volume gracefully and with room to spare.

What Is Your Insurance I. Q.?

by JOHN B. THOMPSON

SEVERAL RECENT SURVEYS seem to justify the conclusion that the field of business insurance has been generally neglected by the accounting profession. Although this statement is directed principally to industrial rather than public accountants, it is perhaps equally true of the latter. Most accountants are familiar with the purely mechanical aspects of recording policies, making distribution and preparing basic valuations for use by others. This, however, is just about "par".

There are a number of reasons which have contributed to the lack of both knowledge and interest on the part of industrial accountants with respect to the subject of insurance. In the first place, too few schools include this subject as a part of their accounting curriculum. It is difficult to understand why insurance should be omitted entirely or given very minor consideration, while a number of general economic courses which are only remotely related to accounting are on the required list. Perhaps an even more likely answer lies in the management policies of many companies in centering the responsibility for its insurance program in an official who, in many cases, is removed from direct accounting functions. This, of course, would have a tendency to minimize the role of the accountant, since his responsibilities with respect to the insurance program would relate to the more mechanical aspects.

However, the accountant, by the very nature of his work, is in a good position to overcome such handicaps. First, he must recognize that an adequate insurance program is so essential to a company's economic existence that it will or should be a prime element of management control. Therefore, if the accountant desires to assume real responsibility in this field, he must prepare for the role. The finer points of insurance are quite technical but, in spite of this, it is a subject which is well adapted to self-education and many excellent books are available. As a general rule, a display of interest will bring an amazing amount of free assistance from professional insurance people who have a "hair trigger" on their sales pitch.

Since personal types of coverage, such as life insurance, are no mystery to most accountants, this article is confined to industrial insurance coverages which

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are essential to business activities. Of course, it would be impractical to attempt in a short article to cover more than the barest fundamentals of an insurance program. It is hoped, therefore, that this "quick trip" will at least stimulate each reader's natural curiosity to explore more fully this important subject on his own.

Types of Insurance Companies

Normally, state laws regulating the business of insurance will limit in charters granted to insurers the type of insurance that can be underwritten. For this reason, it is necessary to deal with several different companies, as a fire company does not underwrite liability coverage and vice versa. Still, there are several different types of companies to choose from within each field of insurance. The basic types described in the following paragraphs are most common.

The stock company is a corporation that operates under the principle of private enterprise in much the same manner as any conventional business. Its net earnings are distributed to stockholders and it usually does business through agents and brokers.

In the mutual company, each policyholder is a stockholder and shares in the net earnings in the form of dividends which represent a percentage of the premium paid. Business with mutual companies is usually done on a direct basis through the company's representatives. In the case of some mutual companies, policyholders may be subject to an assessment in addition to the premium if the operations of the company result in a net loss. In most cases, however, they are permitted to issue non-assessable policies and, in recent years, there has been a tendency for this to be the rule rather than the exception.

The "reciprocal" is an association of insureds, usually of large preferred risks, which is operated by a manager. Each member makes a deposit in lieu of paying a premium, against which is charged the proportionate cost of operating the reciprocal, and the balance is returned to the insured. If the operation results in a net loss, each member is liable for additional assessment on a proportionate basis.

Lloyds is an organization which operates under special authority of the English Parliament and has practically unlimited underwriting powers throughout the world. There is a saying that Lloyds' will insure anything for a price and has at one time or another. Some insureds, who find it economical to be self-insured with regard to certain risks, desire to protect themselves beyond a certain maximum and will arrange for Lloyds to assume the coverage at that point.

Speaking of self-insurance, it is a common practice to some extent with all

insureds. For example, any time you consider a risk too remote to justify paying a premium, you are self-insured with regard to that particular hazard. Likewise, when you carry less insurance than your total maximum loss, you are self-insured to the extent of the difference. A third type of self-insurance is a coverage with a deductible feature. A $100 deductible collision policy means that you are self-insured for the first $100 of each loss.

It is impossible, of course, to design an industrial insurance program without first taking into account all the basic facts peculiar to each company or business. There are, however, check points and guides which are more or less applicable to all businesses. Generally speaking there are two types of insurance:

1. Insurance that pays the individual or company insured money because of some loss which the insured has suffered. This is commonly known as property insurance.
2. Insurance that prevents the party insured from suffering a financial loss because of some circumstance or event by paying claims against the insured to a third-party. This is known as liability or third-party insurance.

A basic approach to an insurance program could take many forms but, in any event, it must give adequate consideration to protecting the company's physical properties, liquid assets, liability exposures and any specialized coverage essential to cope with the peculiarities of a given business.

Protection of Physical Properties—Fire

The company's physical property includes buildings, machinery, other equipment and inventories. Damage to these properties may result from fire and lightning, sprinkler leakage, inherent explosion, cyclones, hail, smoke, water damage, autos, fallen aircraft, riot and civil commotion, malicious mischief, sabotage, floods, earthquakes, etc.

A superior form of fire insurance, with available endorsements, provides coverage against most of these hazards. It is very important to remember, however, that buying fire insurance is somewhat like pricing a new automobile. You start with a stripped down or standard model and add to it the so-called extras that are essential or desirable. The New York standard form of fire policy is most acceptable and has been adopted in many other states. If your company has only a standard form policy that merely protects against fire and lightning and does not include the so-called extended endorsement coverage, it should be carefully examined for what could be serious deficiencies. The only safe rule is to match the specific coverage against any hazards that are prevalent.

It is necessary to understand fully the basis on which losses are paid before attempting to determine the amount of insurance to be carried. Policies covering against losses to physical property provide that they shall be paid up to the policy limits to the extent of the actual cash value of the property at the time of the loss, or the cost to repair or replace the property with deductions for depreciation. The fire insurance policy is a contract of indemnity; it is not intended that the insured should recover more than he has lost but that he shall be placed economically in the same position he occupied prior to the fire (replacement cost, less depreciation). It is well to bear in mind that, with the exception of newly constructed or acquired property, there is likely to be wide variation between the book and insurance value of a given property. Since it is the obligation of the insured to know the value of its properties at all times for self-protection, some sound appraisal system should be employed which reflects both replacement cost and depreciation. Depreciation, as referred to in an insurance loss, varies from the general accounting understanding of the term in that it includes physical depreciation plus obsolescence.

When possible, it is preferable from the insured's point of view to have policies written on an agreed amount basis not subject to co-insurance. The amount of coverage should be adequate, of course, to protect against a severe or total loss. Where co-insurance is a policy provision, the insured must maintain the proper relationship of insurance to value or be prepared to receive only partial recovery in the event of a loss. Actually, co-insurance is a basic principle of fairness in business. It is a mutual agreement between the insured and the insurance company that, in consideration for the company's action in assuming the risk at the premium named, the insured will secure and maintain insurance in an amount at least equal to a specified percentage of the property's total value. Failure to carry adequate insurance to value means that the insured has assumed the risk to the extent of the deficiency. For example, assume that two buildings costing $100,000 each are insured under separate policies with an 80 per cent co-insurance clause, and the amount of insurance carried on Building No. 1 is $80,000 and on Building No. 2 only $40,000. Since Building No. 1 meets the co-insurance requirements, all losses up to the full policy amount would be paid. In the case of Building No. 2, however, settlement would be based on only 50 per cent of any loss ($40,000 divided by $80,000 times the loss).

In multiple plant operations, there can be a distinct advantage to having all plants covered under a superior form blanket policy. For premium purposes only, each plant is rated separately but, theoretically, the total amount of the policy could apply to one location. This type of coverage is particularly ad-

vantageous where inventory values have a tendency to shift radically at any given time from one plant to another.

There is no fixed formula for determining fire insurance rates, as they are the result of the collection and analysis by underwriting associations of data concerning the loss experience of all companies in various locations by different classes of risk. Two important elements always taken into consideration are geographic location and type of structure.

The insured should obtain from his local rate-making agency a schedule showing how the rates applicable to his properties were developed. Each insured has the opportunity to influence to some extent the rates applicable to his coverage, and often the cost of undertaking fire prevention methods is recovered many times over through savings in premium.

To bridge the gap between what is recoverable under the fire policy and the actual cost of replacement, there is a form of insurance that is termed "repair and replace" or "depreciation reserve insurance". The coverage under this type of policy is the same as that under the fire policy. If proper values are carried under both the fire policy and the depreciation reserve policy, the recovery in event of a loss should be sufficient to cover actual replacement cost, thus protecting the capital of the insured. There are many problems in substantiating a repair and replace loss unless the company has an up-to-date appraisal of its properties and the availability of a recent appraisal is generally considered essential to this type of coverage.

Other Physical Property Risks

It is probably safe to say that the average corporate insurance buyer knows less about boiler explosion and machinery breakage coverage than any other because he is almost wholly dependent on his engineering personnel or outside sources to advise him with respect to what should be covered. Since the explosion feature of the fire policy does not extend to boilers or moving or rotating parts of machinery, this hazard should be considered separately. No general rule can be given to indicate the necessary amount of coverage and the advice of engineers should be obtained as to potential damage before deciding on limits. This type of policy includes damage to boilers, other pressure vessels, rotating machinery, damage to nearby equipment and buildings and also to property of others, either on or away from the premises.

Inventories stored away from the premises or which are in transit are not covered under the ordinary fire policy but can be protected through the medium of a marine floater and transportation policy. The amount of coverage required

for goods in transit can usually be set at a fixed limit based on experience. Goods in warehouses or in the hands of suppliers, however, are subject to wide variations and it is customary to obtain a reporting form of policy. Under this type policy, a maximum coverage is set for each warehouse or location but values are reported monthly and the premium is paid on the basis of the average value actually at risk. The reporting form protects the insured for the full amount at risk up to policy limits and requires him to pay a premium only for values actually carried. Quite often a small deductible clause of several hundred dollars will substantially reduce the premium cost.

Autos and trucks, since they are often away from the premises, are not normally covered under the ordinary fire policy but are handled in a separate policy. The amount of coverage can be carried on either an actual cash value or a replacement basis. In the case of damage from accident, collision, upset, etc., where the loss may be only partial, it is customary in the interest of economy to obtain a policy with a deductible clause. Due to the relatively high cost of collision insurance, many companies have taken the position that they can afford to self-insure this hazard.

The properties of each company should be examined for any items which require special attention. Plate glass, for example, is an important item not covered under the fire policy. Any special equipment, such as aircraft, cameras, etc., should also receive individual attention. Generally, it is possible for such items to be covered on an actual cash value or on a replacement basis.

Business Interruption Insurance

Any business suspended because of damage to its physical properties cannot long exist when expenses continue and profits cease, even though the replacement value of its properties will ultimately be recovered. It is important, therefore, to carry insurance that will protect against this hazard. This type of insurance is commonly referred to as use and occupancy or business interruption insurance. The amount recoverable in the event of a loss is measured by the continuing expenses and the loss of profits. There are several variations of this coverage, including (1) protection against loss of earnings and continuing expenses excluding payrolls, (2) including payrolls and (3) a broad form known as the gross earnings method. The latter will develop a higher premium but it is much more flexible in that it can be applied with less restriction to either continuing expenses, loss of profits or continuance of payrolls.

One item often overlooked in connection with this coverage is the potential effect a "close down" could have on the company's state unemployment insur-

ance rating if ordinary payrolls are not covered. If, for example, a company has a one per cent rate for state unemployment insurance purposes and the plant is closed for an extended period due to property damage, the experience rate could soon jump to the maximum of 2.7 per cent. In this illustration, when it resumed operations, it would be faced with a 1.7 per cent increase in the unemployment tax rate, and this could be very costly before the company again had a sufficient reserve to place it in the one per cent classification.

In addition to fire and related hazards, business interruption insurance might be desired in connection with boiler explosion and/or machine breakage, property covered under marine floater policies, accidents involving properties or operations of others and similar hazards which could have a serious effect on the insured's operations.

The rates for this type of insurance are set at a percentage of the fire rates applicable to the properties involved, and a percentage of the rates for all other hazards against which the insurance is purchased. The insurance is normally written on a co-insurance basis that requires periodical reporting of values. Due to the rate structure, it usually costs very little more to carry business interruption insurance on a 80 percent basis than on a 50 percent or 60 percent basis. In multiple plant operations, where one plant is dependent upon another, this insurance should be on a blanket basis which gives full recognition to the intercompany relationship.

Other Coverage of Liquid Assets

The liquid assets of a company are endangered through dishonest acts of employees, forgery, burglary, theft and open stock losses. For each type of crime loss or exposure, there is a type of insurance policy available that can be made to meet the individual requirements of a company. In most instances, the best solution is a comprehensive crime bond that combines in one policy all of the potential hazards that might otherwise be covered under separate policies. It eliminates the chances of overlapping insurance and, at the same time, covers any gaps that might exist between individual policies. It also simplifies and speeds up the settlement of losses. It is usually best to set the limits at reasonably high figures and, in the case of fidelity coverage, to carry excess limits on certain positions. As a general rule, premium rates vary with each insured. As in most insurance lines, however, the insured can influence rates by good internal controls and other practical safety measures.

Too little attention has been paid by business men to the advantages of credit insurance. This seems odd in view of the fact that annual credit losses exceed

annual fire losses. Credit insurance is designed to protect a business from unusual credit losses, to reduce credit losses by encouraging proper investigation and to give the insured the benefit of an efficient collection service. This type of coverage can be tailored to meet the individual requirements of a business. Normally, there is a maximum loss per account limit for each customer of the policyholder and, under the ordinary policy, the insured is made co-insurer for 10 percent of all losses. When this percentage is increased, the liability of the insurance company is decreased and the premium reduced. Since this type of policy is designed to cover unusual, unpredictable losses, the so-called normal or predictable loss is deducted from the gross loss. The premium rate for each credit insurance risk is based on individual circumstances.

Protecting the Company Against Liability Exposures

The law imposes upon everyone the duty of taking reasonable care and precaution to avoid damaging the property or injuring the person of others. Whether or not proper precaution has been taken in any given situation is largely a question of fact for a jury to decide. This poses such a serious threat to company working capital that it is highly important that each business protect itself against such losses. There are a number of highly specialized liability coverages but workmen's compensation, comprehensive general liability and comprehensive auto liability are common to all businesses.

In all states, laws have been enacted that impose upon the employer the obligation to provide for the care and well being of an employee in the course of his employment. Since this is a statutory type of coverage, it is generally well understood. Some of the larger risks ($20,000 or more annual premium) have found it economical to be self-insured up to a point, with a re-insurance provision to cover excess losses. Both mutual and stock companies have certain retrospective type (cost plus plans) policies which are attractive to those with $10,000 or more annual premium, who feel that they can maintain a reasonably good loss experience. Multiple plant operations involving several states will usually find it to their advantage to obtain a blanket-type policy, based on an interstate rating structure. This also simplifies claims where employees of one subsidiary are temporarily loaned to another. Since each risk is individually rated, the policyholder, by insisting on a good safety program, can maintain considerable influence on the cost of this coverage.

All companies need a good comprehensive general liability policy that will protect against legal claims that might arise out of business operations. The policy term, "comprehensive", should not be taken too literally. The conditions

and exclusions in each policy should be carefully studied to make certain that the scope of the policy is clearly understood. To the basic policy should be added any endorsements necessary to fully meet sound requirements and, by the same token, any unnecessary coverages should be deleted. Coverages included under this policy are usually all carried for the same limits, and these limits should be adequate to cover the maximum claim that can be reasonably anticipated. Rates are influenced to a great extent by loss experience, but the general condition of the property, the reputation of management and the nature of the operations are also important factors.

Since claims arising out of injuries from the operation of autos and trucks are excluded from comprehensive general liability coverage, it is necessary for this hazard to be considered separately. Most companies consider coverage of $100,000 per person, $300,000 per accident and $25,000 property damage to be absolute minimum; many companies consider it desirable to carry this insurance at limits of $200,000 per person, $500,000 per accident and $50,000 property damage. It is normally advisable to have a non-ownership endorsement which protects the employer from possible claims resulting from the employee's use of his own auto on company business. Rates for this coverage tend to follow the loss experience of a jurisdiction as a whole. Where an insured operates a large fleet of autos and trucks, a fleet discount and also an experience discount can often be arranged.

Specialized Coverages

The various coverages previously mentioned are more or less common to all business. Unusual operations can require specialized type of coverages which should be given careful consideration. It is a pretty safe bet that coverage can be arranged for just about any type of potential hazard. In planning a new insurance program or reviewing an existing one, contact any reliable insurance broker and request a checklist of the various coverages. This should provide at least a guide for tailoring an effective program.

Basic Rate Structure

In general, there are no fixed formulas for determining insurance rates. The elements which can, and in most cases do, affect rates include the following:

1. Geographic location.
2. Types of structures.

3. General experience of all insureds for each type of coverage.
4. Individual experience and management policies of insured.
5. Special precautions and equipment utilized by insured to minimize the risk.

Since the insured can, in most instances, influence rates, it is important to have a record of the rate structure for each policy. Particular attention should be given to any coverage for which poor experience has resulted in a loading in excess of regular rates and/or conditions which make the risk unattractive to the insurance company. In many instances, a relatively small deductible clause will result in a fairly substantial premium saving.

Until recent years, it was standard procedure to write a 3-year policy for 2½ times the annual rate, and a 5-year policy for 4 times the annual rate. Practically all states have now adopted a new schedule which makes the 3 year rate 2.7 times the annual rate and the 5 year rate 4.4 times the annual rate. By careful planning, policy renewal dates can be arranged to take advantage of the 3 or 5 year rate and, at the same time, keep the yearly cash outlay relatively even.

Retention of Expired Policies

Some companies have a formal record retention program which would include such items as expired insurance policies. For those which do not, the following is suggested merely as a general guide:

1. All policies against which there is a pending claim should be retained.
2. Fire and use and occupancy policies are of no particular value in the absence of pending loss adjustments.
3. Policies covering property in transit should be retained for several months to be certain that notice has been received of any loss during the policy term.
4. Workmen's compensation policies should be kept at least five years and preferably longer. They should be retained until the statute of limitations has run out. (Even then, a case can be reopened.)
5. Public liability policies should be kept for at least five years because of the statute of limitations, and also due to the fact that notice of a claim might not be forthcoming until a long time after the policy has expired.
6. Fidelity policies should be kept indefinitely because there is a continuity of coverage from one to another and a loss may go undetected for many years.

7. Auto damage policies can be discarded upon expiration or after a reasonable period in which to receive notice of a claim which might have occurred during the policy term.

Audit and Review of an Insurance Program

The activity of auditing and reviewing will vary considerably depending on the complexity of a company's insurance program. Certain basic procedures, including the following, should be considered in all cases:

1. Every policy should be carefully read to make certain there is no misunderstanding about what is and what is not covered.
2. A complete explanation should be obtained where there have been rate changes.
3. Valuations and policy amounts should be carefully reviewed at least once a year. Special attention should be given to all policies with co-insurance clauses.
4. An effort should be made to keep abreast of changes and new development in the insurance field. A number of excellent insurance magazines are available, any one of which should be adequate for this purpose.
5. The company's operations should be periodically reviewed for clues to changes which affect insurance coverages.
6. If you have complex problems, consider hiring the services of an outside agency which specializes in insurance audits. Normally, fees are relatively nominal and the agency can render a valuable service.

One More Opportunity

Every industrial accountant should have a good basic knowledge of his company's insurance program. It offers a fine opportunity to enlarge his contribution to management and could be a stepping stone to promotion. It is an area in which a little effort and education could pay big dividends. It might even save a company—and it could be your own.

Leased Tires Inventory

by FRED J. BUSKO*

TIRE LEASING is handled almost entirely by the larger rubber companies which contract to furnish all the tires, tubes, and necessary service and equipment to keep the buses and taxis completely equipped at all times. The tires remain the property of the leasing companies and are carried as part of over-all finished goods inventory. The value of the inventory is based on the estimated remaining life of the tires.

Billing is made on the basis of vehicle miles run each month at the contract rate per bus mile. But the vehicles use anywhere from four tires (on taxicabs) to eight or ten tires (on the big buses.) So the cost of the vehicle miles billed must be computed on the basis of tire miles used. How is this tire mile cost computed? Experience has shown that each mileage customer account develops a distinct "personality" in regard to mileage obtained on leased tires, due to terrain, climate, type of vehicles, etc. To determine an accurate inventory by customer account, a system of averages is used.

In order to determine the life-span in miles of one particular size and type of tire in one customer account, the total number of tires removed from service in this size and type over a period of one year is divided into the number of miles accumulated on these tires by the customer. This will give an average life in miles of tires of this size and type on this particular customer's vehicles. The average thus obtained is multiplied by the number of units in the current physical inventory, giving the potential mile life of the units in the one size and type, providing all such units were 100 percent new. The miles billed to the customer for this size and type of tire are subtracted from the potential mile life, leaving the number of miles considered as inventory.

In order to convert the inventory miles into dollar inventory, the unit cost of the tire is multiplied by the number of units in inventory, giving a total cost for this size and type. The total unit cost is divided by the potential mile life, as described above, arriving at a cost per mile life. This cost per mile life is multiplied by the number of inventory miles remaining in the tires. The result is dollar inventory.

There are often as many as twenty or thirty different sizes and types of tires in one customer's account. If so, the potential tire-mile life and dollar cost per mile are done by accumulation rather than individually as indicated above. The average mile-life by tire size and type must be calculated individually, however, since this is the basis of the entire inventory.

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Profits and the Economics of Credit Sales

by ARTHUR McLAWHON

USUALLY when we think of the determinations that have to be made in advancing credit to a customer, we are concerned principally with the collectibility of the account. In this paper, however, I want to turn attention to more than just credit worthiness considerations. I want to explore one of the facets of credit that is of concern to all who have to do with this area, including top management, viz., the economics of credit sales. If the top management is not shaping credit policies with these considerations in mind, it may be either uninformed of their importance to the financial health of the company, or it may not be completely mindful of its stewardship to the company's stockholders. More probably, it finds itself trapped by competitive practices established in times when profits were better and cost of doing business was not so high.

Let's Go into Business

Let us indulge in a bit of fantasy and suppose that we find ourselves collectively endowed with $100,000 which we would like to use to go into business for ourselves. In other words, we are going to put our hundred thousand dollars to work for us in a business and we expect it to earn for us a respectable return compatible with our risk—let us say, 10 percent per year. How can we be sure that this business is going to earn us a 10 percent return on what we have invested in it?

In a speech sometime ago the President of the General Foods Corporation made this intriguing statement, "A profit is not something that just happens to be left over after you pay all the bills—to the contrary, it is something that must be planned for." Let us engage in some of the planning that is going to be necessary to make sure of a profit that will equal 10% annual return on

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our investment in our business. Let us start by making the following assumptions:

1. That we are going into the household appliance business.
2. That our investigations have indicated to us that the following is true with reference to this business:
   a. The standard markup on appliances is 25%, which will yield us a gross profit ratio of 20%.
   b. Standard terms in the industry provide that our accounts payable must be met on 30-day terms.
   c. In order to be competitive in this business, we must carry on a credit business.
   d. The average collection time on receivables in this business is 45 days. In other words, on the average we will at all times have 45 days of sales in receivables.
3. This is an all out-of-stock business and we cannot count on any direct sales.

At the outset, we must project what our initial outlay will have to be for furniture, fixtures, leasehold improvements, stationery and supplies, and an automobile and a pickup truck. Our projections indicate that this outlay will amount to $16,675. Next, we must make a projection as to what our monthly expenses of operation are to be. This will include rent, salaries, necessary entertainment, utilities, depreciation, etc. Our projections indicate that this monthly expense is going to be $3,100. Then, next, we must project what monthly profit will be required if we are to realize a 10% annual return on our investment of $100,000. Simple arithmetic reveals that this is $833. It becomes apparent, therefore, that in order to meet our monthly expenses and produce our required profit, our business is going to have to generate a gross profit of $3,933 per month.

Now let us compute what our daily, monthly, and annual sales will have to be in order to produce a gross profit of $3,933 per month, assuming the needed 20% gross profit ratio. This computation tells us the following: daily sales must be $655.50; monthly sales must be $19,665; annual sales must be $239,257. Since these sales have a 20% gross profit in them, our cost of annual sales is going to be $191,406.

The problem which confronts us is mapping the course of action that will permit us to produce and support this sales volume within the limits of our available capital. One of the first things we must determine is how much

money will be available for investment in inventory. Let us recapitulate what has happened to our $100,000 so far.

Starting cash		$100,000.00
Capital outlay	$16,675.00	
Cash on hand required (at least one month's expenses)	3,100.00	
Required to support receivables (assuming 45 days of sales in receivables at $655.50 a day)	29,497.50	
		$ 49,272.50
Available for investment in inventory		$ 50,727.50

With $50,727.50 available for investment in inventory at cost, in order for us to support the sales volume which we have determined will be required, we find that this will require an inventory turnover of 3.73 times a year, or just a little better than one turnover every four months. We ascertain this simply by dividing the amount invested in inventory into the cost of annual projected sales. By the same token, we can easily determine that, if we are going to have 45 days of sales tied up in receivables, we must find a way to turn that portion of our capital approximately eight times per year. In other words, we have to sell and collect the total amount invested in receivables eight times a year. Let us prove back these computations to see if they come out right.

INCOME REQUIREMENTS

$ 3,933	For monthly expense and profit
× 12	Months
$47,196	Per Year

INCOME

From Inventory		*From Receivables*	
$50,727.50	Inventory at cost	$29,497.50	Receivables
× 25%	Markup	× 20%	Gross profit
$12,681.00	Profit	$ 5,899.50	Profit
× 3.73	Turnover	× 8	Turnover
$47,300.00	Income	$47,196.00	Income

How Collections Affect Return on Our Investment

So far, so good, if we can perform in terms of our inventory turnover and our receivables turnover. In other words, with our projections, we will produce

the income that is required to generate the 10 percent return on investment which is our goal. Now let us take a look at what would happen if, after we got to operating, we found that instead of being able to collect the receivables in an average of 45 days, our average collection time slips to 60 days. $655.50 sales per day times 60 days equals $39,330.00. Instead of having $29,497.50 of turnover capital tied up in receivables, it develops that we have $39,330.00 tied up in receivables, or $9,832.00 more than we contemplated. This means that we have that much less available to invest in inventory, so, instead of $50,757.00 worth of inventory, we have only $40,895.00 of inventory. Here's the result of that:

$ 40,895	Inventory (At cost)
× 3.73	Turnover
$152,538	Sales (At cost)
25%	Markup
$ 38,134	Income
—37,200	Expenses
$ 934	Profit
.93%	Return on Investment

It begins to become apparent, therefore, that there is a very real relationship between the collection performance we are able to achieve and the sound economics of our investment. What are some of the reasons that would cause our number of days of sales invested in receivables to jump from the 45 days we contemplated to the 60 days which our experience revealed? Of course, the first and most apparent reason would be slow paying customers who permitted their accounts to slip into a delinquent category. An equally important contributing factor could, however, be a policy determination with reference to how many sales we elected to make on a long-term pay out basis.

We can illustrate that point with a very simple, practical case. Let us suppose that we had a building contractor proposition us along these lines. He proposed to us that he was making plans to develop a whole new residential subdivision which would involve the erection of 50 new houses. He intended to equip each of these houses with the appliances we sell and he would like to buy $50,000 worth of such appliances from us along the following terms:

1. No payment until the project was complete.
2. Payments to begin as soon as he begins to sell the houses.

According to his projections, this whole project should be completed and the houses sold within 12 months. He estimates that his first payment would

begin six months after delivery of the material and that the entire amount would be paid for within 12 months. The question is, can we take the deal? And the very obvious answer is that we cannot. If we were to tie up the entire amount of our inventory in one sale and it took us 12 months to collect the amount owing, we would then realize one profit on the $50,000 in the course of a year. Of course, 20% profit on $50,000 in sales would be only $10,000. This would fall far short of our cash requirements to realize a profit on our investment, but also it would not even pay our expenses of operation.

A quick look at what our balance sheet would look like at the end of four months' operation if our business worked out the way we had projected it shows the following:

You and Me Partnership Company

Balance Sheet After Four Months' Operation

Assets		
Turnover capital		
Cash (for expenses)		$ 3,100
Cash (for payables)		12,682
Inventory		50,727
Receivables		29,498
		$ 96,007
Fixed assets		16,675
Total employed capital		$112,682
Liabilities		
Accounts payable	$12,682	
		$ 12,682
Partnership contribution	100,000	
Plus profits	3,332	
Minus withdrawals	3,332	
		100,000
		$112,682

Bear in mind that this balance sheet contemplates that, within a four months' period, we have had one complete turnover of inventory and that our cycle of sales, payables, and receivables has been established. It will also be noted that we have permitted the partners to withdraw the profits that have been earned during this period. This may not be good business, but it simplifies the point I am attempting to illustrate with this balance sheet.

There are two things illustrated, to which I want to invite special attention. The first is that we have two terms that we are dealing with which, though unorthodox on a balance sheet, are very descriptive of what they actually represent. The first of these terms is "turnover capital," and the second is "total employed capital." Turnover capital simply represents that portion of your assets which are available for trade in business. The more often you can turn them over at a profit, the better will be the earning record of your business. The circuit that is made by this turnover capital from bank account to inventory to receivables back to cash in bank, with a profit tagged on, is the real key to a successful business. If there is a slowdown in this merry-go-round at any point, the business suffers adversely. For example, if you permit your cash to lie idle in the bank, it does not earn anything and the business suffers. If you invest your cash in inventory and it lies idle without sales at a profit, the business suffers. And if, by the same token, you permit turnover capital to remain invested for a long period of time in receivables, earning but one profit, business is adversely affected.

Total employed capital is something else again. This includes turnover capital. It also includes those assets which are tied up in plant, equipment, furniture and fixtures, etc. Such assets are necessary in the business, but they do not earn a nickel. The profit which the business earns has got to be realized, as just stated, from the never ending circuit of turnover capital from cash to inventory to receivables back to cash in the bank, with a profit tagged on. And yet when you are computing your true return on investment, not only this turnover capital but the capital tied down in fixed assets must also be taken into account.

Leverage—Use and Misuse

The next feature of our balance sheet to which I would like to call attention is the increase in cash. We started out with only $100,000 in total employed capital, but at the end of four months we have $112,682 in employed capital. Let us see how that happened. It will be noticed that we now have an item of cash in the amount of $12,682 identified "for payables." At the same time, we have an offsetting liability in the same amount representing accounts payable. In the beginning, we determined that the terms of payment in this business were 30 days net. This means that, at all times, we have in our inventory 30 days purchases that we have not yet had to pay for. Our creditors now have an amount equal to 30 days of their sales invested in our business. I have iden-

tified this investment of our creditors' capital in our business as "cash available for payables," but I could just as easily have taken that money and invested it in additional inventory or used it to finance additional receivables or used it to purchase additional fixed assets. In that way it would really be working for us in our business, even though it admittedly would leave us in a position of not being able to pay our bills.

This is a widely used device throughout business, called "leverage." It is the advantage you gain in your own business by utilizing somebody else's capital to work for you. This is a practice to which our good customers have become past masters. If you do not think so, take a look at any recent statement of your accounts and notes receivable and take a look at the past-due balances. This amount represents your turnover capital that is invested in and working for your customers in their business, beyond that amount which results from normal payment within regular terms.

There are other ways in which leverage can be employed, all of which are commonly accepted practices. The most usual way, of course, is to operate on borrowed money. This creates additional liabilities but creates offsetting additional assets. As such, this borrowed money becomes a part of employed capital and, if your business is functioning as it should, you should realize a return on this extra employed capital just as well as you realized the return on the capital you, yourself, have invested in business.

Let me give an illustration of a business which I view as being near Utopia in this use of leverage. A friend of mine is associated in the management of a supermarket chain. He tells me that the standard terms of purchase by supermarkets is 30 days net. The stores turn their inventory on an average of once every two weeks, and their sales are all for cash. Do you get the full implications of what is involved? Here is a company that may carry several million dollars in inventory which it does not have to pay for until 30 days after its purchase. In the meantime, it has sold this total inventory twice for cash. I am sure there must be some offsetting problems to plague the market managers but, from the point of view of invested capital, it would seem that they have nothing tied up in inventory and in fact have completely recovered the value of their inventory, plus its profit, two times before they ever have to pay for the first inventory. If this be true it is surely leverage at work at its best for the supermarket.

An example of an individual businessman who has learned well to practice the art of leverage is a customer who recently visited with me, at my request, to discuss his delinquent account. I asked him to bring in his earning statement for the preceding year, during which time he had continuously owed my com-

pany an amount of $300,000. On our sales to this customer we had realized a gross profit of 14%. In other words, my company had $300,000 of its capital invested in our customer's business on which we had earned a gross return of 14%. Making allowance for the expense of handling this business, our net return on our $300,000 was in the neighborhood of 5%. He also had other creditors with long past-due accounts.

As I examined the customer's financial statements, I observed that he had a net worth of $100,000. In other words, he had $100,000 of his own capital invested in his business. His net earnings for the year were $97,000. While we had realized a net of 5% on our investment in his business, he had taken advantage of the leverage afforded by his creditors to earn himself a 97% return on that portion of his capital which he had invested in his business. I submit to you that this is working leverage to the hilt.

The greatest "rat race" in American business today seems to be to see who can get the most leverage by using the other fellow's working capital. That is what our friend was trying to do when he wanted to buy $50,000 worth of home appliances and pay us for them 12 months hence. If we succumb to enough of such deals, it will lead to our destruction for the simple reason that we will find that our available turnover capital is demobilized to us but is busy working for others in their business. This is all very good to say, but the simple truth is that it is a credit economy in which we are living and if we fail to join the time payment parade, the parade will pass us by and we will miss many sales and profits that otherwise might be ours.

Let us return to our imaginary appliance business for a moment and see if we can figure out a basis on which it would be economically feasible for us to take some term pay-out business, or if it would lead us to destruction as I so dolefully suggested. We saw that, in order to pay operating expenses of $3,100 per month and to realize a 10% return on investment, the business had to generate gross profit of $47,196 a year. We also saw that only $29,497 was going to be available throughout the year to invest in receivables. In other words, that $29,497 had to produce $47,196 in profit, which is 160%. This is an ambitious goal, but if figures don't lie, it must be done if we are to earn the modest 10% return on investment. If we made 20% profit on our sale, it appears that we would have to charge 140% interest in order to be able to carry the account a 12-months' period. Actually it isn't quite that bad. Let us take as an example a $1,000 sale to be paid out in 12 equal monthly installments. This means monthly payments of $83.33. Since gross profit was 20%, our investment in this sale would be only $800. Since investment declines with each monthly payment, we must figure average investment for the 12-month

period. A simple formula for doing this is to divide initial investment by 2 and add to this amount one-half of one monthly payment. To illustrate:

$1,000—Amount of sale	$83.33—Monthly payment		
− 200—Gross profit	$\frac{\$800}{2} + \frac{83.33}{2}$	=	$441.66 Average investment
$ 800—Initial investment			

The $200 gross profit, when viewed against average investment, produces a return of $45%; and the total investment will be recovered in 10 months.

It was previously concluded that 160% of investment in receivables had to be realized annually to meet income requirements. Even though investment was recovered in 10 months in the illustration, gross profit alone failed by $388 to provide the income needed. It looks as if this $388 would have to be realized from interest charges. Two things become immediately apparent to us from this analysis:

1. The interest requirements become prohibitive and no customer would stand for them.
2. The capital structure of the business as it now stands does not permit installment term sales, and to attempt to do so would be truly destructive. The basic problem lies in the fact that an inadequate percentage of total investment is available to finance receivables. Turnover capital earmarked for receivables must work too hard to permit term pay out sales.

How Businesses Counter the Drag of Easy Credit

How then is it possible for businesses to survive following the policies of the fantastic credit schemes we see advertised every day? "No down payment, 36 months to pay" is a common come-on in today's advertising. How do they do it? Well, there are ways in which it can be done. Here are some of them:

1. Offer a discount incentive for early payment of accounts. Two per cent, 10 days is quite common. In other words, sacrifice a part of profit in order to recover working capital so it can be put to work earning another profit. Let us see if this incentive is justified.

45-Day Payment		*10-Day Payment*
$10,000	Receivable	$10.000
× 20%	Gross Profit	× 18% (20% less 2%)
$ 2,000	Profit	$ 1,800
× 8	Annual turnover	× 36
$16,000	Income	$64,800

From this it is easy to see that, if we can get any appreciable number of our customers on a "discount" basis, we have greatly improved our earning potential and have also provided a cushion in our receivable structure to take on some share of the market that wants to buy "on time" without knocking the props out from under our capacity to earn a respectable return from our business.

2. Require a substantial down payment. It is remarkable what a difference a good down payment can make to sweeten a term pay out deal. To illustrate, use the same $1,000 amount and 12 monthly payments used in the previous illustration, but add a 25% down payment to the picture.

$1,000—Amount of sale
— 250—Down payment

$ 750—Amount of receivable
— 200—Gross profit

$ 550—Initial investment

$62.50—Monthly payment

$$\frac{\$550}{2} + \frac{62.50}{2} = \$306.25 \text{ Average investment}$$

A down payment of 25% resulted in a full 20% increase of ratio of profit to average investment and also permitted recovery of the invested amount a month sooner.

3. If you get enough initial profit out of a sale to justify it, then obviously it becomes economically feasible to extend term pay-out deals. For example, persons engaged in the jewelry business or in the furniture business, where I am told a 100% markup is not uncommon, have considerable latitude for accepting term pay-outs and are still able to show a very respectable return from their turnover capital, even though it is demobilized so far as their business is concerned for periods up to two or three years.

This is most assuredly not true in the case of a supply company, where according to statistics our industry-wide gross profit averages only slightly in excess of 13%. If it takes three years to recover invested turnover capital with this kind of a profit, there simply is not the cushion to carry this kind of financing without seriously impairing return on investment.

Application of Interest Charges in Credit Plans

Of course the most popular and widely used device for making it economically feasible to carry long-term financing is the assessment of an interest charge.

This can be a very lucrative way to carry on business so that you not only make the profit on the initial sale, but many types of business have also found it possible to make a very substantial return on investment via the interest route. Below are a few examples of cases in which the interest charge is used.

The revolving credit arragement followed by some of our large chain department stores provides for establishing a maximum line of credit and permitting purchases up to that amount on a continuing basis. The "carrying charge" for this arrangement provides that the customer pays 1% interest on the month end balance of the account. Of course, assuming that a constant amount, for example, $50, is owed at all times, 12% interest is paid in the course of a year. On the other hand, if under this arrangement nothing is owed for one-half of each month, but a month-end balance of $50 appears each month, the interest charge of 1% on the month-end balance will still add up to 12% of the $50 for the year. When you consider that on average you may owe $50 for only six months out of the year, the actual return to the store via this interest "gimmick" is 24% of the amount of its investment in you.

Then there is the case of the vendor or lendor who will advance either funds or credit and charge interest for the entire life of the loan on the initial unpaid principal balance. This is a very common "gimmick" in finance companies. They will advance credit on what they say is 6% per annum interest charge, but, if you start out owing a thousand dollars, your interest rate for the entire life of the credit will be 6% of the thousand dollars, not on the declining balanee. You may start the final year of a 36-month pay out by owing only $333, but your interest charge for that year still will be 6% of the original thousand dollars. Under this arrangement, the turnover capital which the finance company has invested in you earns for it over the three-year period a return of almost 35% from interest alone.

Finally, a way to prepare for a lucrative time payment feature is to get more turnover capital into the business in order to furnish the needed support for a proper ratio of time payment receivables along with net and discount current sales. This can be done by contributing additional capital to the business, but by far the most used method to achieve this is through borrowing. If it is possible to borrow money from a bank at 6% per year and use that money to finance sales through receivables which will produce a 20% profit, and which otherwise would not have been possible, this certainly suggests possibilities. The possibilities are greatly enhanced if your terms also provide for one of the interest "gimmicks" which permit you to recover not only the interest you must pay for your borrowed money but also additional interest which can be added to your profit from the sale. We may not be able to achieve a 10%

return on total employed assets through this method but, most assuredly, it will enable us to increase the return which we will realize from our own contributed investment.

Our more reputable banking institutions will make you a loan for 6% and provide for monthly or periodic payments of accrued interest against the declining balance of your principal indebtedness. Even our fine banks, however, have an interest "gimmick" all their own. Most of us in industry are thoroughly familiar with that good and respectable term in banking circles known as "the compensating balance." That simply means that the bank will lend you a certain amount, but a condition precedent to the loan is that you be required to retain on deposit with it a certain percentage of the funds it lends you. A 20% compensating balance is not an uncommon requirement. In other words, a bank will lend you a hundred thousand dollars and charge you 6% interest on the declining balance, but it requires that you leave on deposit with it 20% of this hundred thousand dollars, so you actually got only $80,000. When you pay $6,000 in interest on a hundred thousand dollar loan, but actually got only $80,000, you ended up paying not 6% interest, but 7½% interest.

Bank Rates Inadequate for Industry

Time and time again I have had customers say to me that they do not understand why I have any reluctance to extend to them long-term credit, as long as they are paying 6% interest. They point out that banking institutions do this all the time and that their profit ratios are very acceptable. I point out to my customers, that there is absolutely no basis of comparison as to what interest rate a bank can charge on loaned funds and what a normal business house must make by way of return on its invested turnover capital. A bank's operating expense often amounts to less than 1% of its outstanding loans. Compare that with the typical business house where operating expense ratios to sales of 10% to 15% and more are not uncommon. Most businesses that realize anything like a normal profit from sales, therefore, are "kidding" themselves when they think that they can invest their working capital in long-term sales and be content with interest that is comparable with the interest rates charged for loans by banking institutions and still make a respectable return on the investment in their business.

What is an Adequate Return on Investment in Receivables?

If this interest rate is inadequate for business, then what can be considered

adequate? There are so many variables between businesses and, for that matter, so many variables within any one business at different times that there can be no predetermined categorical answer. Proper consideration of the following questions, however, can help in arriving at credit policies which will be economically sound:

1. What average gross profit ratio can be expected from sales?
2. What is your cost of doing business?
3. Is working capital available in your business for investment in term sales?
4. Do you have banking arrangements which permit you to finance term sales without impairing ability to carry on business?
5. What is the ratio of investment in receivables to other investments in your business? And what average turnover do you have to realize from receivables in order to show a satisfactory return on total investment?
6. What percentage of total receivables can you afford to have invested in term pay-outs?

When the answers to the above questions are known, then, and only then, can it be determined whether term credit can be extended and, if so, how much down payment must be required and, finally, what interest or carrying charges must be imposed in order to make investment in the term sale a sound one for your company.

In the final analysis, the decision must be based on this simple cardinal principle: "There is no justification in sound economics to have capital invested in somebody else's business unless it earns enough for your business to justify its investment." This simple principle will not be given wide acceptance until managers generally (1) become educated to the necessity for adequate earnings if their businesses are to remain economically healthy and (2) lose the inbred philosophy which seems to prevail in some quarters that there is something unclean about making a fair return on capital invested in someone else's business through receivables.

It might be interesting simply as a practical case in point to recite the procedure followed in our company in arriving at a determination as to whether or not we can grant the terms of payment requested by some of our customers.

After studying actual performance within our company over a number of years and being familiar with our capital structure and its limitations, we have concluded that we can afford to invest in term pay-out receivables about 30% of the working capital which has been earmarked for receivables. As long as

we do not exceed this ratio, we have found that we have ample capital to support the discount sales and short-term sales necessary to keep our profit position healthy. We have learned that we must be on the alert at all times for the economic trends, however, and if the state of the general economy in our industry were to reach a point where the maximum amount of capital we have available to invest in receivables could be used in discount sales and short-term sales, it would be foolhardy to tie up any portion of it in long-term pay-outs.

Further, through analysis of the income which must be realized from receivables, we have concluded that, in order to justify tying up our money in a long-term pay-out, our working capital so invested in the business of another must produce for us from profit and interest a return of at least 1½% per month of the average investment for the entire term of the deal.

In order to facilitate this determination, we have worked out a table which gives us a quick answer, applying any combination of those all important factors —gross profit, down payment and pay-out period. If the deal proposed does not measure up to our minimum return on investment requirements, we do not feel justified in taking it. We can use this table, however, as a basis for a counter-proposal which would be acceptable to us. Such counter-proposals at times involve a shorter pay-out period, a larger down payment or, by agreement, an increased amount of profit.

Theoretically, if we are satisfied with the earnings on invested working capital from term sales, then we need not be too concerned about how long it takes the customer to pay off the obligation. There is, however, one basic truth in the relation of payments made to sound economics. If a customer completes a project and gets paid for it and does not pay off the obligations incurred in connection with the project for supplies and materials furnished, then one of two things has happened without fail—either the customer did not get paid enough to pay off his bills and lost money on his project or he took the money which was intended for the payment of materials and supplies and appropriated it to his own use. This appropriation may involve dissipating the funds foolishly, or it may involve investing the funds wisely (for him) in the acquisition of additional assets for his business. If your customer has done either of these things, you cannot long afford to do business with him. He is either a bad businessman and is going for broke, or he is appropriating your turnover working capital for investment in his own business, thus creating leverage to himself at your expense. In either case, the customer must then earn future profits to pay off obligations for which he has already received the income and obtained the cash tax advantage. To pay these obligations out of future profits is going

to be a much tougher assignment for him and many more hazards are involved in so far as a creditor is concerned.

Conclusion

To summarize, if we are to continue to engage in the credit business—and continue we undoubtedly must—then it is incumbent upon each of us concerned with this problem to acquaint ourselves with the economics of credit sales and their impact on profits and to exercise all the influence we can to see that our policies are shaped accordingly. Since competition usually dictates what we must do in business, no one company can do this alone; it involves mass education. I hope that I have at least planted a seed that someday will begin to bear fruit so that industry to which we all owe our livelihood and to which we give so much of our time and our energies will find itself on a sound economic basis adequately compensated for the services it renders and the risks that it takes.

Better Inventory Classification with Less Work

by ROBERT L. VAN DeMARK*

INDUSTRY is constantly seeking more efficient methods of operation. Each year we see new machines introduced that will do the work of two old ones. Complementing the new equipment are improved systems which promote drastic reductions in manhour requirements, both for factory and office. Within the past two decades, the field of production and inventory control has introduced new avenues of cost reduction and control. One significant area of cost control has been that of the application of "economical lot-sizes". These, when used consistently, have been found to reduce company setup costs and order preparation costs while improving inventory turnover and sales coverage. The use of this relatively new control tool can be extended to bring to business automatic inventory classification and the added benefits of lower costs and systems simplification.

Inventory Classification Now

Inventory classification as a basis for more effective inventory control has proven to be a powerful tool. Classification of materials by usage and value has permitted application of the rule of exceptions to inventory control procedures. Inventory gradations have segregated expensive items for close control and have relegated the masses of low-usage, low-cost materials to more infrequent but adequate surveillance. The benefits have been sizeable: better inventory turn-over, more exact sales coverage, and lower control costs.

It is not unusual to find that 10 to 20 percent of the material items in an entire inventory represents over 70 percent of the total usage-value each month. It is also normal to find that another 50 to 70 percent of the total accounts represents only 5 to 10 percent of the total monthly usage-value. Inventory classification segregates these items within three or more arbitrary usage-value limits so that each material may more nearly receive attention relative to its importance. The high usage-value class is closely controlled while the low usage-value class is maintained with procedures requiring a minumum of time and effort.

While in no way detracting from the outstanding improvements made available through such systems as the "ABC System" of inventory classification, there are two serious short-comings connected with the present systems:

1. Cost of classifying.
2. Arbitrary class limits.

Classifying an entire inventory means establishing preliminary gradation lim-

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its, assigning each item to a level according to that item's usage and value, accumulating all levels for inspection, and affirming or re-aligning the gradation limits to reach the optimum spread of items over the various levels. At first with luck and later with experience, the classification limits can be established quite accurately prior to the assigning of the items the first time. However, the classification job is relatively laborious and costly whether or not the gradations have to be altered. In addition, the arbitrary class limits provide "grey" areas of potential disagreement and improper handling at the upper and lower ends of all adjoining levels.

A Classification Example

To illustrate the problem of classifying, let us take a small inventory sample of 100 items. The over-all usage value is from a few cents to $500 per month. Our first attempt at classification might show the following:

Class	*Limits*	*Items*	*Total Usage-Value per Month*	*% Items*	*% Total Usage-Value per Month*
A	0-$0.49	40	$ 10.00	40	0.6
B	$0.50-$1.99	20	90.00	20	5.5
C	$2.00-up	40	1550.00	40	93.9
Total		100	$1650.00	100	100.0

We can see that our classifications have not provided the desired result, i.e., to separate a large percentage of items with low usage-value from a small percentage of items with high usage-value. So back we go to alter the class limits in another attempt to obtain better classifications as follows:

Class	*Limits*	*Items*	*Total Usage-Value per Month*	*% Items*	*% Total Usage-Value per Month*
A-1	0-$1.99	60	$ 100.00	60	6.1
B-1	$2.00-$9.99	25	300.00	25	18.2
C-1	$10.00-up	15	1250.00	15	75.7
Total		100	$1650.00	100	100.0

The second attempt at inventory classification shown above will promote subsequent selective inventory controls. The A-1 items will be placed under relatively loose, inexpensive controls, such as a bin reserve system. The B-1 items will receive the average amount of attention normally given through a perpetual inventory system. The C-1 items will receive regular, close scrutiny through isolation of the perpetual inventory accounts and periodic status reports.

From this brief example, we can see

the nucleus of the inadequacies of the present classification process. The classifying process is haphazard, the results (while beneficial) are costly and time consuming, and the classification limits open to debate. Who can argue that an item showing a $9.90 usage-value should not receive that same treatment as one showing a $10.10 usage-value?

Proposed Automatic Classification

There is a way to avoid the two basic inadequacies of inventory classification while retaining the original benefits. The method lies simply in using economical lot-sizes for all ordering, both purchasing and manufacturing. When you use economical lot-sizes computed on a consistent basis, the order sizes automatically develop re-order frequency consistent with the usage-value of the specific materials. High usage-value items develop lot-sizes requiring frequent re-ordering, permitting frequent analysis for inventory control. Low usage-value items develop lot-sizes which require only infrequent re-ordering, eliminating unnecessary costs of checking small material accounts for usage changes.

To illustrate how usage-value changes affect the lot-sizes (when computed with the economical formula) and resultant re-order frequency, let us review a single inventory item. We shall hold all the factors other than usage-value constant while we alter the unit costs. The following chart shows the order-size changes with increases in the unit cost.

Unit cost	$0.03	$0.15	$0.65	$2.80
Usage per month	1000	1000	1000	1000
Setup or preparation cost	$20.00	$20.00	$20.00	$20.00
Usage-value per month	$30.00	$150.00	$650.00	$2,800.00
Economical lot-size	10,000	4,300	2,100	1,000
Month's supply	10.0	4.3	2.1	1.0
Orders per year	1.2	2.8	5.7	12.0
Order value	$300.00	$645.00	$1,365.00	$2,800.00

We see above the rather obvious result of altering the unit cost while holding all other formula factors constant. The lot-sizes decrease steadily with increases in the unit cost. The order frequency is low for the low-cost item, but the total cost itself is large enough to warrant regular review. Thus, we have shown how automatic inventory classification applies to individual items without special effort.

When economical lot-sizes are used on all inventory items, the entire inventory is automatically classified. Each item is then given equal consideration at the time of re-order because the re-order frequency is now commensurate with its relative usage-value. At each re-order point, the usage potential is

reviewed for possible adjustment of the re-order quantity and timing. Only through such surveillance applied to all inventory items can you obtain consistent, close inventory control which will develop a balanced, profitable inventory.

When you use economical lot-sizes, the two inadequacies of the present classification systems are eliminated, as there is no formal classification process and there are no arbitrary classification limits. Simply establish the economical lot-sizes and give each re-order equal consideration. Each item will then receive due and economical attention. If you wish to supplement this control with reports on your items representing high dollar value, such reports can quickly be accumulated by taking all items the lot-sizes of which are within a given range of "months' supply". For example, you may pick out all items the lot-sizes of which provide less than one month supply based on current usage. Such a category will automatically include all your high usage-value items.

Proof of the Pudding

The proof of any suggested improvement is actual application. A study has been made of the inventory operation of a manufacturing concern* in which the principle of automatic classification has been applied. Originally this company's inventory had been classified using a modified "ABC System". Subsequently, economical lot-sizes were computed for all items in the inventory. To test the principle of automatic classification, a sample of 627 inventory items, both purchased and manufactured, was taken at random and analyzed. The original classifications were preserved and additional figures collected on item dollar usage and lot-size costs. From these figures the following analysis was obtained.

Class	*Limits*	*Items*	*Monthly Usage*	*Economical Lot-Cost*	*Months Supply*	*Orders per year*	*% Usage*	*% Items*
1	0-$0.05	266	$ 1,130.34	$ 7,523.29	6.7	1.8	3.4	42.4
2	$0.05-$0.25	158	2,766.72	12,203.78	4.4	2.7	8.3	25.2
3	$0.25-$1.00	132	7,043.00	23,138.25	3.3	3.6	21.1	21.1
4	$1.00- up	71	22,375.00	30,783.00	1.4	8.5	67.2	11.3
	Total	627	33.315.06	73,648.32	2.2	5.5	100.0	100.0

The chart shows clearly that, through the use of economical lot-sizes, we have been able to obtain automatic inventory classification. The low usage-value class (No. 1) exhibits an average high month's supply (or low number of orders per year). The high usage-value class (No. 4) shows just the opposite, with the average re-order coming every 1.4 months or an average of 8.5 orders per year. Thus, in this company, we have been able to

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establish a basis for frequent review of the costly items and economically infrequent review of the inexpensive items. All this we could have done originally by applying the economical lot-sizes and never classifying the inventory at all. At least now we are sure that the principle proposed by this report is correct and proven in actual use.

Compound Benefits

As with all business improvements we gain principally in two areas: lowered costs and reduced time requirements. Automatic inventory classification from the use of economical lot-sizes can save money through the following:

1. The cost of inventory classifying is completely eliminated.
2. Satellite reductions in set-up and order preparation expenses are obtained. In the example, there were normally about 3,450 purchasing and manufacturing orders placed per year on the material studied. With economical lot-sizes and automatic classification, the number of orders was reduced to about 1,985 orders per year.

Automatic inventory classification brings the following time savings:

1. There being no arbitrary class limits, each order receives equal consideration. You are certain that each material receives its just review whenever ordered. There are no fringe areas for error or argument. No searching for classes and rules. You have a single procedure to supervise.
2. Consistent order-sizes provide a solid base for placing all ordering (purchasing and manufacturing) within a systematic routine. You can establish system limits easily, assured that regular items will be properly handled and exceptions will be referred to supervision for special control.

Beyond the specific money and time savings, you obtain the intangible benefits of explainable control and peace of mind. Herein lies a sound basis for all your ordering while affording economies of procurement and reporting. Your inventory controls will conform to the specific requirements of your materials. Your control reports can be taken directly from your inventory records without special effort. Finally, your inventory control is based on most-economical operation and is ready for realistic budgetary goals.

You can obtain automatic inventory classification through the use of economical lot-sizes. Actual application of economical lot-sizes to the inventory of an operating business has shown that it is practical and beneficial. This system of automatic inventory classification preserves the usual benefits of improved inventory turnover, more exact sales coverage, and lower control costs while adding the additional benefits of further cost reductions and systems simplification.

Do You Work With Figures?

by GEORGE A. SYMANSKI

THE MATERIAL contained in this paper was first gathered for a training course for services analysts in the postal service. Its acceptance by this group led to a belief that like information would be of help to individuals elsewhere in the conduct of their work. In approaching these subjects I have assumed that many individuals have been exposed to statistics and figures but never in a manner in which they have had to use them to do their job. Also, that, each day, individuals are apprehensively approaching a job requiring the use of statistics, analysis, comments, or simple forecasts or that there are some individuals being asked to compile statistics or make analyses without appreciating the necessity for them.

To these I will state categorically that statistics are both interesting and meaningful. You must, however, create a desire to read and utilize them, being extremely careful not to imply immediate conclusions from them but to check them out from other available means.

Internal and External Statistics

In its singular form, statistics is the science which deals with the collection, classification, and use of *facts or data,* especially the information or facts on a specific subject that can be stated numerically. In its plural form, statistics are the numerical facts or data collected, classified, and tabulated. There are two broad types of statistics, with numerous subdivisions only exemplified by those given below:

1. Internal—facts or figures that come from inside the business.
   a. Volume of work by hour or half-hour each 24 hours.
   b. Number of employees by hour or half-hour each 24 hours.
   c. Number of supervisors by hour or half-hour each 24 hours.
   d. Volume of output.
   e. Work units of output per worker.
   f. Number of workers.

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g. Customers served; stops, etc.
h. Truck utilization.
i. Kilowatt hours required per day.
j. Overtime, sick leave by work areas, routes or stations.

2. External—facts or figures that come from outside the business but have a direct bearing upon its operations.
   a. Changes in habits of customers.
   b. Changes in transportation, etc.
   c. Changes in handling and packing of products at warehouse points.
   d. Weather.
   e. Regulations or laws.
   f. Economic conditions.
   g. Trend in prices of needed materials or machinery, etc.

The businessmen of a generation ago were forced to rely on estimates and few meager statistics for data on which to base their judgment. Not so today. There is an amazing wealth of general statistical information at their command. Their problem now is largely that of choosing the sources which will best meet their purpose. Statistics are needed to produce bases for judgments in the handling, distribution, and transportation, and for keeping a proper balance between manpower and workload, plus providing at all times the best possible service.

It is not hard to make this concept concrete by thinking of organizations which use external data of various kinds to advantage: cities for expansion of facilities and roads; businesses to locate offices, or warehouses, restaurants to determine eating habits of patrons; groceries to determine purchasing habits; insurance companies for policy costs, etc.; post office for rates, costs, reduction of accident rates in motor vehicle service; manufacturers to locate areas out of line with normal. The uses of internal statistics are even better known.

It is probably safe to say that all businesses use statistics. Further, the progress of a business depends upon the ability of all levels of management to use good judgment. This can be no better than the facts and information on which it is based. Facts covering angles of a problem, not guesses or opinions, are essential to good judgment. Statistics provide the basis for the good judgments exercised daily in private business, municipal and federal government as in no previous period in history. Who has not had an experience in which statistics helped cure a problem or the lack of statistics caused an erroneous decision? However, many of us make the mistake of feeling that statistics can only be

used at highest levels of management. This is far from true, as statistics are needed at all levels of management—by foremen, supervisors, superintendents, etc., for the exercise of good judgment and planning. The real problem is that of selecting those which will contribute most effectively to the control at all levels of management.

Don't Get Lost

The best procedure in selecting facts for statistical compilations is to start by answering the question, "Just what do I want to know?" It will help if the answer to this question is written out, because the exact purpose or use of the facts to be compiled should be definitely known. This purpose or use should be sufficiently important to justify the expense involved, for determining what statistics are required, although supposedly simply and easy, is sometimes immensely difficult, and errors costly. No rules can be laid down, for every case is a matter for individual study and analysis. It is at this stage that many make their first mis-step. They become lost in the zest of hunting up and chasing down all the available related information: they allow themselves to be dragged off the scent of the fox by every jack rabbit that crosses the trail.

When you find this happening, you will be able to recognize it by the bewildering sensation in your solar plexus the first time a friend drops in and asks in a heartless way, "What's the good of it?" Right there is a good time to stop (it would have been still better earlier) and ask again, "What do I want to know?" Think back once more to your original position and what you set out to learn. If you find you are on the wrong track, bravely scrap the work you have done, and strike out again. Your goal is a certain piece of information. Statistics are merely the road to that information.

It is important to remember that operating statistics do not always tell the whole story. There are certain intangible conditions, such as the morale of employees, which may not be reflected in daily production for several weeks, particularly in a unit where the work is well organized. Improper training or inadequate instruction in the job to be done or in the use of machines or equipment, lack of coordination between manpower schedules, etc., or failure to recognize changes in trends may have unexpected impact.

A common mistake in statistical procedure or development is to compare facts that are not logically comparable. The use of such facts in management reports will prove a painful experience. Comparisons of certain ratios or results of operations are often misleading because of variations between the basic unit of measurement, the makeup of the work center, the type of product or process,

type of facilities used, or the use of different factors in developing the data being used for comparative purposes. Make certain that your comparisons have a uniform unit of measurement.

If statistics are to be useful, they must be accurate—but how accurate? In *compiling* the statistics, use exact figures, but the *findings* are often most useful when presented in round numbers. Do not give a false impression of accuracy by quoting figures carried to several places beyond decimal, when you have merely a sampling as a basis. Of course, common sense should be your guide since the degree of accuracy required will always affect the cost of getting statistical data.

Strange as it may seem, many of us overlook the wealth of material already available for statistical study. By all means determine availability of data before requesting it from other sources. If you must request data from operating or other sources, constantly keep in mind the purpose of the investigation or survey. It will save your time and the time of those who will be developing the data. A good prescription to follow is to talk to others about it.

Tables, Charts or Both?

Regardless of how meticulously the data has been developed, it must be presented in such a way that the meaning and importance stand out clearly and unmistakably. The process of giving life to statistical facts usually takes two general forms: (1) numerical tabulation (2) charts or graphs. The assembling of statistics for presentation naturally starts with numerical tabulations, for it is only through the collection and properly arranged tabulations of numerical facts that charts and graphs may be constructed.

The purpose of a statistical report or study gives the key which answers every question of selection, grouping and presentation of numerical facts or the omission of facts collected. The simpler the tabulation the more readily its meaning will be grasped. Tabulations should be arranged in logical order to facilitate: the finding of the desired numerical facts, the obtaining of subtotals for naturally related groups, the comparison of items and subtotals the relationship of which may be desirable to study. We should place the more important figures into the foreground of attention. We can do this by showing these figures in the first column or first few columns and putting the supporting figures in the succeeding columns. Grand totals, for example, are often more important than the detailed figures. Logically, they should appear in the right-hand column or along the bottom of the tabulation. Many statisticians, however, list the grand totals at the top and in the first column, printed in bold

face type, with wide spacing between. In short, profit from advertising techniques. The figures in prominent positions are studied first and details are studied in the light of the story the totals tell. Remember, the busy boss is interested in totals as a means of control.

While numerical tabulations give management an important means of control, their usefulness can be greatly increased by presenting them in chart form. The mind can grasp, study, and compare the relationship of many facts when these facts are presented in chart form. As indicated earlier it is usually necessary to develop numerical tabulations before you can chart. Tabulations may contain several columns, whereas you may only chart the significant elements. In brief, there are three advantages to the use of charts: (1) more vivid relationships are presented (2) charts can provide a means for making accurate, simultaneous comparisons of variations (3) charts show trends more clearly.

Nevertheless, a chart may misrepresent fact even though each dimension on it is exact, fair and truthful. Care should be taken to make sure that erroneous conclusions are not relayed because of exaggerated trends and relationships depicted on charts. Six of the more essentials of good charts are:

1. They should be laid out on as natural a plan as possible. They should read left to right and, where one variable is time, it should show the earliest period on left or at the top.
2. Zero line (or base line) should always be clearly indicated and emphasized.
3. Method of presentation should be free from optical illusions.
4. The title should be so complete and descriptive that it can be understood by one who knows nothing more about the chart than the title tells. Every chart should be dated.
5. Many times it is desirable to show the numerical tabulations immediately adjacent to the chart, thus providing for any computation that anyone may desire to make.
6. Simplicity is essential. Do not try to show everything that is "showable" on one chart.

There are many kinds of charts being published today and there are many books on the subject. By critically examining some charts in the light of these six essentials, it is possible to absorb much real value from charting methods explained. Do not be misled by the many over-ingenious methods used in charting. Remember that a chart should help the reader interpret accurately and quickly the message contained in the statistical facts portrayed by the chart. The chart which does this accurately and surely is a good chart, no matter how simple or how crude its workmanship.

Simply defined, analysis is separation of a whole into its component elements, the process or method of studying the nature of a thing or of determining its essential features, or a brief presentation of the essential features of a statement, process, or method. Analysis and interpretation usually have as their objective the formation of an opinion with respect to the condition, results or status of a business, or operation within the business. Interpretation of statements or studies constructed by the accountant or analyst take him right to the goal of his labors, the supplying of information that will aid in the management of the business.

The many books written on financial and operational analysis should be obtained and studied for the analytical tools or devices normally employed. These tools to be employed will generally depend on the objective. If it is your purpose to study proportions in statements, the analysis will consist of computation of vertical ratios. If an intensive study of changes occurring periodically is desired, you will make comparative statements in terms of dollars or percentages. The analyst should not, however, regard ratios as precise measures which are on a par with measures used in sciences. Any factors that are out of proportion or any extreme variations that have taken place should be regarded only as indicators of areas for attention. Having taken notice of these out-of-proportion ratios or unusual variations, the further and important step is to see explanation for it. Although the computation of ratios and the use of other measuring devices help bring out facts which might otherwise be overlooked, interpretation or comments on statements or results is a mental process for which there is no mechanical substitute. The good analyst uses the measuring devices as guides which point the way to matters for investigation.

This should be fresh-minded and aggressive. The size of operations, the physical location and the many influences on costs furnish a great opportunity to assist management in controlling these influences. If operations and procedures are never analyzed critically, they may never be improved. Too many functional procedures are followed year after year in many businesses for the simple reason that they produce results after a fashion. But look at the many changes that have occurred in recent years—service, production, transportation, utilization of machines and equipment, accounting methods, etc. These could not have taken place if someone had not examined each.

But interpretation must be communicated. The most significant part of operating reports or studies is the interpretation and supplemental information worked into the presentation. Analysts should remind themselves continu-

ally that their work and responsibility only starts when the facts and figures are available or understood by them.

The following are a few suggestions as guides for interpretive comments: (1) be brief (2) be specific (3) use simple terminology (4) if results are bad, give reasons and projection of probable future results and corrective action which has been or should be taken (5) if results are good, give credit.

A good way to start the closing portion of this paper is with the statement, "Before looking into the crystal ball—get the facts." A forecast founded on logic is dependent—even more strongly dependent than routine decisions—on the soundness of your information. We, as accountants or beginning analysts, are always prone to confuse our prejudices with true knowledge. First, we should agree that forecasting revenues, volumes, sales, manpower, etc., is necessary, if efficient use is to be made of personnel. Secondly, forecasts result from judgments and assumptions made by someone in top management. Actually, a useful forecast is the result of a multitude of judgments which have been made about many different factors. Perhaps I should say the forecast *should be* the result of a multitude of judgments which have been made about many different factors. Let us list some precautions. First, it may be assumed that any forecast of future conditions contains an error. This is inevitable. What is important, however, is the magnitude and direction of the error. Here are some guides to accuracy:

1. Make certain that there is agreement on the meaning of the words used, such as: receipts, revenues, work units, man-hours, man-years, market potential, sales potential, sales quota, short-term and long-term.
2. Maintain or develop adequate records of past revenues, volumes, manpower requirements, etc., by as many breakdowns as feasible. This data is extremely useful in determining future needs or revenues more accurately.
3. Review past forecasts to find out what errors in procedure or judgments were made. Such reviews will build up a valuable backlog of guideposts toward improved forecasts.
4. Be sure to include all factors that may have a bearing on future revenues and volumes. These might include; breakdowns of past revenues, volumes and productivity, business conditions locally, changes in mix and makeup of orders, effects of weather, policy changes, etc. It is important to make note of various facts as they happen. When you need them, you will then be happy to have this file of notes.
5. Evaluate trends in terms of dollars, work units, and manpower needed for specific work-loads.

6. Explore the use of information available from local and state government and the many businesses in your locality.
7. Become acquainted with the tools of forecasting, such as opinion surveys and charts. Use them with the local historical data you have accumulated for several years.
8. Leave room in the procedures for personal judgment to supplement all the other factors that are involved.
9. Compare the forecast results with those of others in the same or related businesses.
10. Check your forecast with the national forecast for comparability.
11. Revise forecasts at least every three months and project the succeeding three months. In this way, management can take corrective action to adjust to current conditions.

"Do-It-Yourself" Work Simplification Will Get It Done

by EDWARDS R. FISH, JR.

EVERYONE within reaching distance of management responsibility, and this certainly includes those in the accounting profession, sees the need every day for finding ways to do things better. For instance, five-day monthly closing periods become a necessity when the business climate changes weekly instead of quarterly; daily comparison of a mass of charges against standards must be made to maintain a cost system which will give control at the same rate as production moves; and payroll preparation often results in more deductions and reports than it does paychecks. Yet all this must be accomplished by a staff which is pure overhead and, therefore, subject to rigorous restriction in size and space. Management people in general and accountants in particular are squarely up against the need to find and use better methods in a hurry.

Why Work Simplification Is a Good "Inside Job"

One possible solution is to hire outside consultants, people who are thoroughly trained to find places where improvements can be made and who have wide experience in many applications. These specialists are extremely valuable in many ways, particularly in over-all evaluation of weaknesses, but the consultant is an outsider to the employees and the necessity for common defense against outsiders has been part of our social order since feudal castles had moats.

Many firms maintain industrial engineering staffs whose principal duty is to improve methods throughout the organization. It is my opinion that many of these groups are a waste of money because they try to change ways of doing things without securing the participation or interest of the people involved, and thus do not accomplish a fraction of what they should. The staff engineer is in much the same position as the consultant—he is an outsider to the people whose ways he tries to change. Therefore, it can be concluded that even with the best of consultants or staff assistants available to help, work improvement to be successful must be directed and exemplified by line supervisors. If they

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are not interested, the employees will not be interested, and no outsider, regardless of ability, will be able to make lasting work improvements. If supervisors are interested enough to set an example of work simplification and to prove to their employees that change and improvement are a necessary part of the job, then the results will be astonishing.

Constructive creativity is basic to most humans, it simply needs to be brought out and put to work. Witness the application of do-it-yourself to many creative fields in recent years—homebuilding, music and landscaping are a few examples. Also, many fields of art have opened out and put to work talent and energy not before used. Why should not the same constructive effort be applied to building something out of the monotony of daily work? Personal satisfaction from accomplishment—the prize that the human ego seeks—results just as fully from a successful creative project related to the daily job at work as it does from skill at a hobby or sport. Years of habit and custom, however, have separated "the job" from other aspects of daily life to the extent that only the rare employee attempts on his own to seek accomplishment by creativeness there the same as he does with his hobbies. But habit and custom can be changed, even if slowly, and the full mental ability of people can be used to improve ways of doing things on the job if those in charge make up their minds to provide the right direction and example.

"Do-it-yourself" work simplification, the process of getting the people to work continually at making their jobs easier, either individually or in groups, is particularly adaptable to office operations. For one thing, the educational and social level of most office workers is generally above that of factory employees, making them more able to see the broad background of their work. This is a great help in considering the effect of proposed changes. Besides this, the usual office environment, especially in small and medium-sized establishments, makes for the continual close working contacts so essential to stimulation and exchange of ideas. Also, much of the work is done manually with details of method left up to the individual on the job. Such things as sorting procedures, amount of checking and proofing, and keeping of accumulation figures "so I'll be ready if someone wants a report on it" are most often controlled by the employee because they are manual and individual operations. For the same reason, working speed or pace is usually up to the individual to decide and can be greatly affected by his attitude toward the work and its rewards. And, finally, changes are generally easier to carry out in the office, once co-operation is secured, because the capital requirements are not likely to be as great for manufacturing equipment, nor do paperwork or accounting changes entail much risk of affecting product quality or production rate. It seems strange that in the

face of these several favorable factors more attention has not been given to reduction of office costs through work simplification.

Start People Thinking by Thinking Yourself

"There's a way to do it better, find it"!, was a favorite admonition of Thomas Edison to his researchers. He did not say, "here is a better way I've found, use it", he said, "there's a way, *you* find it", meaning that an organized search for a better way was required. That is what work simplification is—the organized use of common sense to search for better ways of doing things. Putting it on a do-it-yourself basis guarantees acceptance of the changes which inevitably accompany improvements and, in addition, makes available the combined common sense of many people. It is the only way to conduct a sound program of work methods improvement but, like everything else which is simple in principle, it requires experience and practice. A number of suggestions follow which are based on experience and which are offered to guide those who wish to start by creating acceptance of change instead of resistance to it.

Acceptance of change will be created best by making change a part of the daily routine. An attitude of open-mindedness toward improvement is the inevitable result of making improvement a continuous effort. Anyone who wishes to secure acceptance of new ideas from his employees or subordinates must first show that he, himself, is not afraid of change. He must set an example by putting improvement above stability in his own work. Only when his attitude and actions show clearly and consistently that creativeness is accepted will the people around him begin to ask questions about their own work. It is slow, patience-trying work usually, with great differences in response depending on personalities, but it will always produce results if done honestly.

If you want to start people thinking, ask their help sincerely and honestly on a problem on which they have some experience. Tell them what you know about the background of the problem, then realize that they are actually specialized consultants who can do more about it than you can. If they believe that you mean this, they will do all the soul-searching required and come up with the best answers their experience and ability can afford. Some years ago the author had a good lesson in this when he was asked to find the reason for poor production and quality of a certain specialized production machine which required extensive setup time between jobs. It did not take long to see that the operator was indifferent toward the job and that he had no apparent interest in improving the condition. Finding the reason for this took a bit longer, but finally it developed that there was inadequate supervision for this part of

the plant. The operator had attempted once to secure a place to store his machine fixtures and to get help in the compilation of a machine setup record, both very necessary to reduction of setup work, but no one was interested. Several weeks of careful work were required before he could be convinced of the company's interest in his problem, but he finally pointed out on his own the need for supervisory assistance in solving the production and quality problems. When this was supplied, he carried out his original plans and the trouble was eliminated.

If work simplification projects are selected properly and the people guided into working in areas in which they are best experienced, highly practical answers will result. The excellent job which an assistant foreman did in solving the problem of attaching count tags to pallet loads of completed glassware is a good example of this. When asked to help by the production manager and industrial engineer, after they had tried several unsuccessful ideas, he quickly developed a tag which served as a verification of daily production count and could be attached to the load without using fasteners or marking the product.

Very often the solutions worked up by interested employees will be different from your own. Use of a high degree of intellectual honesty is required to recognize ideas which are better than yours, as well as to give factual, impartial arguments against those which are unusable for some reason. Quite often it is desirable to let an employee pursue to a dead end some idea he is especially fond of, if the cost is not too great, rather than to dull his initiative by what may seem to him to be an arbitrary turn-down. He will quickly learn to value your confidence in him and it will not be long until he will present only the results of thorough analysis and testing. If you are honestly desirous of improving methods and reducing costs by using the full ability of everyone connected with the operation, you will not be concerned if other people have better ideas than you do. Their response to your coaching and direction will furnish enough improvement for everyone to have a share of the credit.

How do you set an example for finding "a way to do it better"? What sort of work do you pick? How do you show employees what sort of ideas will help? Just as in any other field of endeavor, the best way is to start simply. Teach yourself to ask questions about the why and the how and the when of everything you do, but particularly teach yourself to stand back and listen with an open mind when your questions are being answered. The whole secret of do-it-yourself work simplification is to provide a receptive environment for new ideas, for new ways of doing things.

Start by questioning the seemingly unnoticed little pieces of daily routine. For example, when looking for a certain one of a stack of invoices or bills of

lading, do you turn each one over individually or do you clamp them flat on the table with one hand and riffle them quickly with the other? Is your desk file-heavy and the drawers cumbersome to pull out dozens of times a day, and so low you have to lean out of the chair to see the divider tabs? Why not have a file drawer cabinet next to the desk at correct height so that a swing around in the chair and a gentle pull on the handle will bring you eye-to-eye with the information you want? Do you keep reminder notes in all sorts of places and then spend time hunting for them, when a narrow metal strip on the wall and a few flat magnets would keep them always in place? And why not reserve a top desk drawer for a waste basket to save turning, throwing, and picking up the near misses? These are seemingly insignificant things that will seem even laughable to some people, yet they are samples of elementary work-saving principles. If the elements of looking for the easy way to do things become a habit with you, they will be picked up by the people around you, especially if these people become convinced that you are truly interested in the progress they make. When improvement in the small matters has become an accepted habit, attention can be turned to more important changes for which extensive group participation is required.

Six Steps of Work Simplification Practice

Over the years, work simplification practitioners have developed a series of steps to facilitate teaching of method improvement principles. These steps are so simple and logical that anyone can be shown how to apply them, once the proper atmosphere of interest has been created. First, select specific pieces of work to which to direct attention. These may be only your ideas at the beginning, but you should be guiding the thinking of others as you point them out. Here are some typical examples of things which you and your people will soon get in the habit of noticing and changing.

1. *Would information now kept in books be easier to find and use in a tub or roll file?* For instance, are sales orders being priced from pages kept in a loose-leaf binder which must be propped open on a desk, flipped back and forth, and even turned around, because some pages are arranged lengthwise, when the same information can be put on an index file mounted in a desk drawer and operated with one hand? As another example, simplicity-minded payroll clerks can usually replace the traditional small black book of hourly pay rates with a small roll-type desk-top file where any of dozens of rates can be found in seconds. Loose-file methods will often be objected to in the early stages because of the fear

that easily removed cards will be lost. This is not a problem however, because the person in charge of the file soon accepts responsibility for its maintenance as a small price for the convenience.

2. *Is data typed which can be handwritten?* It is true that some executives are still fussy about receiving anything handwritten, but many can see that the speed and simplicity of handwriting most of the data that passes around inside a business can save labor and overhead. For instance, I know of a record of daily production which was recorded by hand, then typed at the end of each month in four copies. This monthly issue consisted of up to 20 pages of figures requiring several hours of time to copy. After several years, the practice was questioned and it was determined that the original hand-made entry could easily serve for the intermittent reference use made of the typed copies. Complete elimination of a time-wasting and fatiguing operation resulted.

3. *Are records transcribed or re-tabulated when a one-writing system would eliminate the copy work and the errors which inevitably result?* So many well-proven methods of eliminating hand transcription of data are available that any copying work should be an immediate point of attention. Payroll, inventory, sales orders, purchasing and receiving records, department cost reports—all of these routines have been helped by use of one-write installations. Some systems use special carbonized forms in connection with an indexing method for handwriting when a posting machine cannot be justified; other systems make use of simple but rapid duplicating machines equipped to use variable-field masters. And still another idea fast expanding its field of use is photocopying, equipment for which is available in many sizes and speeds. Use of imagination will uncover many operations which can be simplified or eliminated by using a photographic copy in place of a hand transcription.

4. *Are identical series of calculations made week after week or month after month, when a pre-calculated table of values would permit direct reading of an answer?* A good example can be drawn from a recent experience in our own scheduling office. It is necessary several times a day to compute the number of cases of glassware which will be produced at various operating speeds and rejection rates. For a long time this was done by longhand or with a slide rule, but recently a couple of hours work with a calculator has provided a complete wall chart of speed, rejection rate and packed quantity which gives anyone the answer at the raise of an eyelid.

5. *Do periodic heavy surges of office work, such as shorten tempers at the month-end, cause mistakes, or require overtime pay?* Recurring high-pressure workloads often can be reduced by group study of the jobs involved. Such study by open-minded people who want

to find a better way will nearly always show up ways to combine, reschedule or re-assign operations. Closer scheduling and establishment of workable deadlines for each operation will always help to smooth out peak overloads.

6. *Are group leaders, supervisors or executives doing routine work (posting, calculating or charting) which can be assigned to clerical help?* This happens frequently because of a desire to "keep track of what is going on" by someone who has not learned that a properly arranged report will tell a better story and save the department money at the same time.

Now for the second step. After a specific piece of work has been selected for improvement, it will be necessary to find out a lot about it. To make a successful change, you need to understand the purpose of the present way, what and who will be affected by the change, how much it will cost, how much time it will take, and many other things. Thorough and detailed questioning after facts of the job will prevent silly mistakes and failures which result from half-baked ideas. Many of the stories told about the "efficiency engineers" of past days are examples of sloppy fact-finding, a characteristic of these self-styled experts.

Thoroughness in getting and understanding the facts is mandatory for successful work simplification. Because employees must usually be taught this by error, by example, and by patient coaching before they can arrive at really workable solutions, it is a good place to use a consultant's training and experience. If such facilities are not available, however, proper habits of thorough inquiry can be self-taught by non-experts. Here are some typical questions that must be asked about any job before it can be properly understood:

1. What is the purpose?
2. When is it done?
3. How long does it take?
4. What is the volume of work?
5. What equipment is required?
6. Who does it? How often?
7. Who uses the product? For what?
8. How many people do it?
9. What forms are used?

This list, by no means complete, seems a formidable one to undertake just for the purpose of changing something, and may well discourage anyone not sincerely interested. It should be remembered, however, that, if proper motivation and encouragement are provided, the resulting interest and pride of accomplishment will prevent discouragement and even cause people to welcome the assistance of such checklists.

Knowledge of all parts of the operation can now be put to use in questioning each part of the job to develop better ways of doing it. This is the third

step. The objective of course is to *eliminate* as many parts of the operation as possible. When this cannot be done, steps may be *combined* with other parts of the job, or *simplified* by providing more equipment or a better work-place arrangement. Open-minded questioning is required here to provide a free-wheeling flow of new ideas, because an open mind will make questions lead to new ideas for different ways of doing things.

A practical example of this is brought to mind by the case of two bookkeepers who worked in the office of a small private club at different times. The first one worked under an ineffective and unpopular manager, so naturally kept out of trouble by opening neither his mind or his mouth. Later, after the manager was replaced by a new capable executive, a new bookkeeper was installed in an attitude of change and improvement. The result was a continual questioning of the old ways of doing things, followed by installation of many new procedures not even thought of by the consultants who had instigated the reorganization.

No long and detailed list of sample questions is necessary to guide this step of challenging each detail of the process. The only requirement is to continually ask "why" and not settle for anything less than a full answer. Open-minded "whying" will bring out new ways of doing almost anything, if carried on steadily with the people doing the job.

The fourth step in work simplification consists of making the new method work. Actual installation of new changes should always be a group undertaking which evolves naturally from a joint attack on a problem. Such changes will come smoothly and naturally if certain common sense procedures are followed until they become a matter of habit. The most important of these procedures are:

1. Double check effect of the changes on others with questions such as: Will the new method add work or complicate checking in a later step? Will it affect the customer's records in any way? What do the auditors think about it?
2. Experiment with actual installation. A "dry run" with inexpensive mimeographed forms before the present method is scrapped is always a wise precaution. Have everyone help out in the experiment, encouraging ideas for further improvement while the plan is still flexible. Some of the best improvements may be discovered at this stage, when the system is in a tangible form and can be completely visualized.
3. Get everyone to set a schedule for changing over to the new method. No one should be in the dark as to when his way of doing things is to be changed; in fact the person on the job usu-

ally knows best when the switch can be made. An interested employee will often be ready to schedule a change in a surprisingly short time and, in addition, will do a thorough job of checking with others to make sure they will be ready, too.

4. Keep a record of results. Formal reports may or may not be necessary, but some sort of informal write-up is always valuable for reference. Its preparation can be a good opportunity to have a "post-mortem" with employees on results of a new project, and it can often be used as training material for new employees. Such information can even be a valuable reference when other management people start to comment on the good performance of your group and ask for your assistance!

Work Simplification—A Way of Living the Work

Do-it-yourself work simplification is neither a program nor a campaign; it is a way of working—for yourself and for those who look to you for leadership. It must be practiced and worked at by the people on the job. Outside consultants or company staff assistants cannot enforce it; they can only assist with ideas and guidance. Successful work simplification requires conducive conditions, honest acceptance of new ideas by those in charge, continuous evidence of interest by superiors, and full opportunity for participation by everyone according to ability and experience. Do-it-yourself work simplification applies to the smallest of daily jobs, so there is plenty of chance for anyone to practice it and gain skill for the solution of complex problems. The experience of many people has proven that "simplification-mindedness" can be developed into a highly effective time-saving habit which can be transmitted to others by example.

The results of its encouragement are most rewarding, as an office manager friend of mine recently discovered. His head bookkeeper, a long-time employee whose precise work had been matched only by her firm resistance to any innovation, has finally taken note of his keen interest in developing office work short-cuts. Now she not only stoutly supports adoption of a new billing procedure which he had her help develop, but she has also turned the heat on him for a thorough study of ways to change the accounts payable procedure to reduce the month-end rush.

Perhaps we should even change Mr. Edison and, using the first person plural, paraphrase his advice to, "There's a way to do it better—*let's* find it!"

More State Income Taxes — and Returns?

by K. K. KNUTZEN*

A RECENT U. S. Supreme Court decision has paved the way for individual state taxing authorities to tax any and all corporations conducting business or shipping material into the taxing state. This ruling was handed down as a result of cases which originated in Minnesota and Georgia testing the authority of a State to tax a portion of an interstate company's income earned within its borders, whether or not the out-of-state company has an office within the taxing State. The extent to which this privilege will be used and will expand in the next few years is difficult to estimate; however, since it is known that many state governments are in need of increased tax revenues, the taxing of out-of-state companies can be expected to expand as rapidly as state laws can be proposed and adopted. Legislation of this type will result in many more corporations having to maintain records which will permit easy segregation of shipments into individual states and having to file many more tax returns than are currently being filed.

At the present time, there are 35 states which levy corporate income taxes and most of these have laws which permit the taxation of interstate income. All of these states, plus the fifteen additional ones, now have backing to expand the taxation of interstate shipments. Most of the large corporations having offices and divisions throughout the country have been filing individual state income and franchise tax returns in several different states due to their widespread activities. The impact of new laws and wider spread taxation, as mentioned above, will, therefore, not have a great effect on the large corporations. It will increase the work and cost of doing business on the part of the small and medium-size corporations which will be required to file and pay taxes in additional states.

We consider our company to be in the medium-size class. Our annual sales volume is approximately ten million dollars and we have manufacturing locations in California and Texas and sales offices in two other states. At the present time, we are filing state income or franchise tax returns in five states, including the states of Georgia and Louisiana where we have no sales offices. Each of the states in which we file tax returns has a different formula for allocating income to that particular state. There is no true uniformity of formula; however, most of them seem to include factors of sales, inventories, investments and payrolls. Even in this

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instance, differences in formulas apply to such things as the state in which the shipment originated, its destination, or where an order is received and accepted, regardless of shipping destination.

In reviewing the limited number of state tax returns which we now file, we note that each one requires complete information with respect to balance sheet and income statements. Also, each one requires this information in a different form from that of any other state. In one return, we are required to complete six pages of detail on a printed form in addition to supplying three pages of attached schedules. In the instance of the State of Georgia, we have been required to file tax returns together with attached schedules and apportionment formula computations since 1949. Our taxes paid to the State of Georgia in each of these years have been as low as $1.02 and have averaged $41.79 per year during this ten-year period.

In preparing the various state tax returns it is our responsibility to review the individual state tax laws and prepare the tax return in the manner required by the particular state. For small and medium-sized corporations to have to keep detailed records segregating shipments and any other factors which might be affected by an individual state allocation formula, in addition to reading and knowing the tax laws of all States which may wish to take advantage of this recent Supreme Court ruling will certainly make a significant increase in the cost of doing business and maintaining records to comply with state government requirements. I am sure that many companies will also find that the cost of maintaining the records and preparing the returns will far exceed the amount of taxes they pay many of the states. We certainly found this to be true in the instance of filing returns and paying taxes to the State of Georgia.

The subject of tax payments to individual states also brings to mind the purposes of taxes and the services rendered by taxing authorities. It is difficult to determine any real service provided our company by the State of Georgia as a result of our paying taxes to them. Perhaps our reward is in their keeping our customers in existence and giving us the legal permission to collect amounts due us. However, this is little in true value in the service of a state to an out-of-state corporation.

During the past several years Federal legislation has been proposed or enacted to grant preferred treatment to small business firms. It would appear that this recent Supreme Court decision is now making it more difficult for the small and medium-size business corporation to continue to stay in business and make a profit. Our Federal legislators could now come to the rescue of small business corporations by enacting legislation which would permit the acceptance of an or-

der and the shipment of material any place in the U. S. without making the businessman liable for taxes and penalties with which he may not be familiar. If this would result in favored treatment, it would seem that it would be no more favored than the treatment accorded our foreign competitors who may ship material into individual states without being taxed. If our elected representatives do not wish to enact legislation which might limit the taxing powers of the individual states from which they come, perhaps they would find it possible, as an alternative, to coordinate or recommend allocation formulas which would permit uniform taxation of income throughout the various states. It would appear that such uniformity could be coordinated with the Federal taxing authorities in much the same maner as individual states have been encouraged to enact unemployment insurance tax laws and benefits in accordance with a national pattern.

It is suggested that individual corporate officers and accountants review their positions with respect to the present and probable new state tax laws as they relate to the filing of tax returns. Steps should be taken to anticipate changes in order to avoid liability for themselves or their corporations for failure to file tax returns which are required. As by the accountant, he should also be prepared to allocate income to each of the various States. I am sure he will find it easier to do this through current record keeping than to have to do it retroactively three or four years hence.

Manpower Planning — A Case Study

by GUERARD H. HOWKINS, JR.

A DESCRIPTION of the process used by the Equipment and Systems Division of Raytheon to plan manpower for 1959 is presented here to illustrate a classical approach and solution to the problem. Raytheon produces and markets electronic components and equipment. The company consists of 38,000 employees and 12 operating divisions. This case study describes the method used by one of the divisions to plan monthly requirements for people a year in advance.

The Equipment and Systems Division produces a complete line of marine electronic equipment for ocean-going vessels and for pleasure craft. "Light" marine equipment, used to illustrate this case, is sold through an extensive dealer organization to operators of light commercial craft and to owners of pleasure craft. Among the products in this group are radio telephones, radio direction finders, and Fathometer* depth sounders. The "heavy" marine product group includes radar and recording depth sounders which are sold directly to ship operators.

Each year the divisions of Raytheon prepare plans which cover five years in the future. The plans include statements of objectives, short-term plans, long-range plans, provision for measurement of performance, and budgetary controls. Collectively the various plan segments are called the annual plan. Since payroll and payroll related costs are the major single expense item in the annual plan, each organizational entity must develop an integrated manpower plan on which the various payroll expense categories are based. In addition, each division submits to the corporate level on specified formats a summary of its annual plan. This includes a projection of the number of people to be employed by the division during the next five years and is in monthly terms for the first year.

On the corporate level, the financial aspects of the annual plan are administered by the budgets and planning department under the direction of the con-

* Registered trademark.

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troller. The controller of each division has a counterpart on his staff in the manager of budgets and planning. The division controller is responsible for measurement of performance against the plan and, in this connection, publishes regular reports comparing the actual to planned headcount at various levels of responsibility. He provides a monthly statement of planned headcount during 1959 in three payroll categories, hourly, office, and monthly. The figures to be used in schedules had to be developed in depth and integrated with the various segments of the annual plan.

Administrations, Sales, Engineering—And Manufacturing

The administration and sales departments planned their manpower and departmental expense through the medium of fixed expense budgets and manpower planning sheets which were printed and distributed to each department head. Planners in the departments were in possession of basic data with respect to organization and activity levels from which reasonable estimates of the number of people and expense for 1959 could be determined. The engineering departments planned within the framework of the engineering expense projects authorized by managers of the equipment and systems and industrial apparatus divisions, approved general research projects, and engineering for specific customer applications.

The manufacturing department planned from the unit sales plan—beginning inventory levels and inventory objectives—and the stated requirements for interdivisional activity. In the manufacturing area (purchasing, packing and shipping included), the sales plan projected a downward trend in activity caused principally by withdrawal of specific products assigned to the Industrial Apparatus Division. A production plan, stated in units, was developed and the requisite input for labor, material, and expense calculated. Because the job of planning manpower for the manufacturing plant was the most difficult, the description of the planning process centers in this area. A review of the method by which the manufacture of products for sale is authorized will be helpful.

A large portion of the products of the Equipment and Systems Division is sold from inventory rather than manufactured to order. The problems of having sufficient stock of each item to sell, objectives for investment in inventories, and risks of obsolescence are further complicated by highly seasonal influences in the market for "light" marine products. Consequently, sales must be accurately predicted in advance of a decision to build. The number of different products sold in the "light" marine categories can cause swings in the sales mix independently of total volume. The authorization to manufacture which is acted on by

the factory is initiated by the product manager, who controls the selling organization. It is released only after consideration has been given to historical sales, projected sales, and inventory levels. The authorization states the total quantity of an item to be made and the monthly delivery schedule required.

A production schedule is published each month by the plant, which contains projected monthly delivery of units to finished good stores through the year based on approved authorizations received. Each month near-range revision to the monthly quantities delivered is given effect after considering most recent sales inventory predictions. Thus, effect is given to the most current condition in the market and, because of variable market conditions, the mix in actual factory deliveries in a given month will not follow the plan formulated prior to the start of the year. The lead time from receipt of authorization to delivery of products varies with the individual product being considered but averages four to six months.

Manpower Planning Technique

The production plan for the year, as developed from the unit sales forecast, projected a downward trend in factory direct labor. This was caused by the transfer of certain products to the Industrial Apparatus Division and by seasonal marketing effects. Rather than budget expense for a different labor level each month, it was decided to create a step plan for direct labor, showing the decrease as being accomplished through two intermediate levels, with the annual total being controlled by the plan. It was, therefore, necessary for the manufacturing staff to determine which expense elements were relatively fixed and which were variable or semi-variable. Indirect labor reductions were planned to occur when direct labor levels decreased both in the manufacturing departments and in the associated manufacturing service area. The indirect labor levels were determined by consultation between the plant manager's staff and the various department heads involved.

For each department in the plant, a manpower plan was prepared showing the beginning-of-year status and monthly changes in each job category. The plans were priced using job classification rates, planned increases, and number of working days in the month. The consolidated budgets for the manufacturing plant represented a step approach to the planned work-force reduction on a realistic basis. Direct labor, consisting of production, assembling and test people, was built up from the manufacturing activity required to support planned sales. Support labor reductions were budgeted to occur when the direct labor decreases were given effect. The resulting manpower plan was, therefore, com-

pletely integrated within the frame-work of the annual plan and was developed in depth from the department or section level.

Manufacturing manpower was combined with engineering, sales and administrative manpower to produce monthly figures by payroll categories to show how many people were planned for the division. It was recognized that the actual direct labor level in the plant may swing up or down from plan in the near-range, because of actual production deliveries required in a given future period. However, if sales follow the planned pattern, it is reasonable to assume that actual results will conform to the plan when viewed over a period of several months.

The manpower plan was required *prior* to development of the expense plan. This is logical, since about 60 percent of expense is payroll related. Thus, the labor expense budgets in the division are based on a plan for specific people required in the future rather than projection of historical dollar ratios. The plan contains all elements of data necessary to analyze and isolate any manpower variance which may occur.

Detailed Planning Procedures

The Manpower Planning Flow Diagram (Exhibit 1) shows the sequence followed and the format used to transmit basic data to the plant for planning, construction of a Sales-Inventory Production Plan (Exhibit 2), determining direct labor input requirements by the Assembly and Test Hours Calculation Sheet (Exhibit 3), recording monthly requirements for people by skill, Department Manpower Plan (Exhibit 4), the dollarized expense budget exemplified in the Department Payroll Expense Budget (Exhibit 5) and the Division Manpower Plan (Exhibit 6). A description of the use of each schedule in the sequence follows.

Exhibit 2 is the sheet on which division management transmits sales and

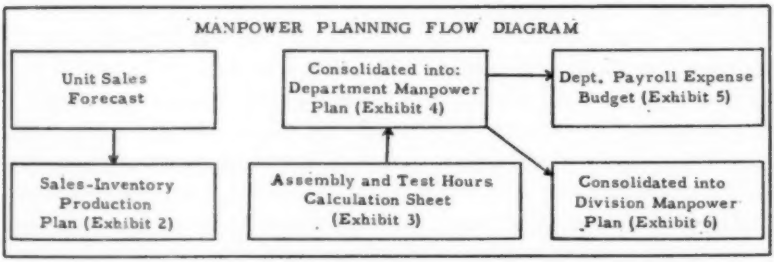
MANPOWER PLANNING FLOW DIAGRAM
Unit Sales Forecast
Consolidated into: Department Manpower Plan (Exhibit 4)
Dept. Payroll Expense Budget (Exhibit 5)
Sales-Inventory Production Plan (Exhibit 2)
Assembly and Test Hours Calculation Sheet (Exhibit 3)
Consolidated into Division Manpower Plan (Exhibit 6)

EXHIBIT 1

Units ☒ Dollars ☐

SALES - INVENTORY PRODUCTION PLAN - 1959

KEY: P - Production; SC - Customer Sales; SI - Interdiv. Sales; SL - Leased; I - Inventory Level; R - Sales to Inventory Ratio

(A) Line No.	(B) Product Description	(C)	1958 Ending Inventory	1959 Total Year	Jan	Feb	Mar	1959 First Quarter	Apr	May	June	1959 Second Quarter	July	Aug	Sept	1959 Third Quarter	Oct	Nov	Dec	1959 Fourth Quarter
1	Indicator Assy.	P		600	-	-	50	50	100	100	120	320	80	100	50	230	-	-	-	-
2		SC		600	20	35	45	100	60	90	100	250	80	50	40	170	30	30	20	80
5		I	100		80	45	50	-	90	100	120	-	120	170	180	-	150	120	100	-
6		R	6																	

EXHIBIT 2

ASSEMBLY AND TEST HOURS CALCULATION SHEET

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1. No. of Units			50	100	100	120	80	100	50				600
2. Assy. $/Unit													
3. Assy. Hrs./Unit	4.5												
4. Total Assy. Hrs.			225	450	450	540	360	450	225				2700
5. Test $/Unit													
6. Test Hrs./Unit	1.5												
7. Total Test Hrs.			75	150	150	180	120	150	75				900

EXHIBIT 3

inventory data to the plant. The plant staff plans production for the year on the same sheet, using the data furnished with respect to monthly unit sales forecast, beginning inventory positions, and inventory turnover objectives. The data

shown on Exhibit 2, which is prepared by division management, includes the forecast of shipments (Line 2), beginning inventory (Line 5), and an objective sales to inventory ratio (Line 6). Based on the three elements of data as listed, the manufacturing department plans monthly production deliveries (Line 1). Quantities shown in the exhibit illustrate the process as applied to a specific product.

Exhibit 3 is a spread sheet to record the budgeted assembly and test direct labor hours for one unit and to extend these hours for the units to be delivered in each month. The monthly deliveries are recorded on Line 1. These are taken from Line 1 on Exhibit 2. Direct labor assembly and test hours per unit are shown on Lines 3 and 6, respectively, and the total hours input required for assembly and test on Lines 4 and 7. The same product as illustrated on Exhibit 2 is used for the quantities on Exhibit 3.

For the product being considered, the direct labor lead time is assumed to be less than one month, so input and output coincide in time. The Exhibit 3's are summarized to provide monthly totals for assembly and test labor. A factor was added to the totals to incorporate direct labor for spare parts and accessories which were not unitized in the sales forecast. This factor is based on a projection of past experience modified as necessary by the forecast dollar value of items in this category. The exhibit, therefore, pro-

DEPARTMENT MANPOWER PLAN - FISCAL 1959

Number 12/31/58	Job Description and/or Classification No.	Payroll	Additions or Deletions												Number 12/31/59	Comments
			Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec		
1	Supervisor A	M													1	700/Mo.
2	Supervisor B	M													2	1200/Mo. (?)
1	Staff Assistant	M									(1)				-	500/Mo.
4	Analyst A	O									(1)				3	@ 2.20/Hr. plus 5% Sept
3	Analyst B	O				(1)					(1)				1	@ 2.00/Hr. plus 5% Sept
6	Clerk	O				(1)					(1)				4	@ 1.50/Hr. plus 5% Sept
17	Total					(2)					(4)				11	

EXHIBIT 4

DEPARTMENT PAYROLL EXPENSE BUDGET - 1959

Acct. No.	Expense Category	Total 1959	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	Monthly Indirect Labor	25,185	1,766	2,207	2,759	2,097	2,207	2,759	1,103	2,207	2,372	1,743	1,743	2,222
10	Office Indirect Labor	37,931	2,986	3,733	4,665	3,287	3,183	3,980	1,594	3,183	3,447	2,403	2,403	3,067
	Hourly Indirect Labor													
24	Absence & Severance	765	60	75	95	65	65	80	30	65	70	50	50	60
29	Fringe Benefits	8,623	650	812	1,015	736	736	921	368	736	795	566	566	722
	Total Personnel Cost	72,504	5,462	6,827	8,534	6,185	6,191	7,740	3,095	6,191	6,684	4,762	4,762	6,071

EXHIBIT 5

vides the direct labor hours required in the two prime producing departments of the manufacturing plant, e.g., assembly and test. The hours so calculated were plotted on a time scale by months to determine whether unusual requirements were being made in specific months. These, when found, were levelled by projecting into the adjoining periods, and a trend line was drawn. This appeared to be consistent with the forecast sales and showed a rather rapid decline in April, followed by a shallower decline through the summer.

This condition agreed with the general "feel" for the future as held by the plant manager and his staff and it checked out with known loadings as stated in the most current formal production schedule. It was, therefore, decided to build the monthly labor and expense budgets from the labor hour plan. Rather than plan on a labor level which changed each month, it was agreed to introduce average levelling during periods of shallow decline, followed by a vertical drop to a lower level at the end of a specific month. This created three direct labor levels during the year. The production and production service departments planned their labor levels accordingly.

Exhibit 4 represents the manpower plan for a production service department. It lists the people in the department by job description or classification numbers, payroll category, and number of people at the end of 1958.

Additions or deletions are shown monthly. In this case, deletions coincide with the vertical drop in direct labor payrolls. Monthly or hourly pay rates are shown for each classification and a general 5 percent increase for office payroll in September. No monthly increases were planned.

Exhibit 5 represents the labor expense budget for the same service department. The labor dollars represented by the people on Exhibit 4 are recorded monthly. Expense of non-personnel categories are not included in the example. Monthly payrolls are dollarized by dividing the pay per month by 174 and multiplying by the number of working hours in each month. Office payroll is extended by the working hours per month. Two percent of the office payroll was subtracted and is shown under Account 24, Absence and Severance. Fringe benefits were calculated at a flat 13½ percent.

DIVISION - MANPOWER PLAN - 1959

	Payroll Count	Jan 1959	Feb 1959	Mar 1959	Apr 1959	May 1959	June 1959	July 1959	Aug 1959	Sept 1959	Oct 1959	Nov 1959	Dec 1959
1	Hourly	304	301	301	279	279	278	248	248	237	237	237	237
2	Office	153	152	153	152	152	151	151	151	148	136	136	136
3	Monthly	143	141	143	143	144	143	143	143	143	140	140	140
4	Total	600	594	597	574	575	572	542	542	528	514	514	514

EXHIBIT 6

Exhibit 6 is the form on which the consolidated division manpower plan is submitted to the budgets and planning department. The payroll count figures were developed in depth and are integrated with the various segments of the annual plan.

Illustrations Embody Principles

The schedules used illustrate a way of producing a fully integrated manpower plan by a series of simple steps. The exact format and sequences shown may not be applicable in all instances. However, the principles outlined definitely are. Manpower planning which is based on the plans of department heads produces data which has maximum utility in the over-all plan and has maximum value as a control.

You Can Rent It — But Should You?

by FRANCIS T. KNOUSS

TO BUY OR NOT TO BUY—that is the question that faces the executive who needs new office equipment ranging from a typewriter to a computer. Considering the number of typewriters and similarly priced equipment used in the office, a wrong decision as between buying or renting may add a significant number of dollars to costs. When the machines in question are expensive accounting machines, punched card equipment or other such office tools, the dollar difference between a buy or rent decision may have a considerable bearing on profits. The same problem exists in the fields of automotive equipment and manufacturing facilities.

Pro and Con

Every buy-or-rent problem involves a study of the relationship between the purchase price and the amount of the rental for the same article. Some circumstances favor renting and some favor buying. They vary with equipment, with the financial position of the company, and with the use contemplated for the equipment. Any investment requires a commitment of funds with the expectation of earning a satisfactory return on those funds over a period of time in the future. This applies to investments in stocks and bonds, in buildings, equipment and other types of fixed assets. It applies as well to investment in office equipment which might otherwise be rented. The return one receives from buying equipment, rather than renting it, arises from the avoidance or saving of a series of rental payments and the substitution of depreciation charges. The decision whether or not, and how, to acquire each item of equipment is an individual problem. A company need not decide to buy all of its equipment or to rent all of it. Some factors are common to large groups of equipment and some may be common to all equipment in a single company.

There are certain advantages and drawbacks in leasing:

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ADVANTAGES

1. Capital thus freed can be used for profitable investment, but freed capital must be kept working. If a company permits its surplus to remain in bank deposits, the lease or any other financing method will prove far too expensive.
2. Leasing may enable a company to use modern equipment which it could not afford to obtain otherwise. With leasing, there is not much danger of being caught with a heavy investment in obsolete equipment when more efficient and modern equipment becomes available. When a company is in doubt as to the economic advantage of purchasing certain equipment, a short-term lease thereon might be considered.
3. Leasing may be a feasible method for obtaining equipment needed for a specific purpose or for a limited period of time. Equipment for a one-time job or contract or for a venture involving a substantial element of risk can be obtained under a lease plan, without the company having to worry as it would if it purchased the equipment whether it can later adapt the equipment to another operation or to a changed situation.
4. Leasing is highly advantageous where expert servicing of the equipment is required. An excellent example is a lease covering the use and servicing of tabulating equipment. The complexity of the equipment and the user's dependence on the manufacturers' representative to keep it operating, make the lease arrangement particularly advantageous in such situations.

DRAWBACKS

1. Leasing frequently exposes the lessee's operations to some supervision by the lessor. Of course, supervision of the use of certain types of equipment is often justified for the protection of the lessor as well as for the assurance of satisfactory performance of the equipment, but there have been some instances of the lessee's freedom being restricted to such an extent that the usefulness has been impaired.
2. Leasing a piece of equipment usually will have the final net result that the cost eventually will be greater than if the machine had been purchased in the first place.
3. A company leasing equipment may run the risk of losing it at the end of the lease and not being able to obtain replacement on a rental basis. To avoid this risk, a company should seek the inclusion in the lease contract of a purchase option or a right of renewal.
4. If leased equipment does not provide anticipated income, through increased sales and profits, the fixed rental charges could result in

sharp losses. In a period of sagging profits, this may put a severe strain on cash.

Today's competitive markets require up-to-date equipment and technology to ensure cost reductions. Equipment in many industries is being subjected to fast obsolescence because of rapid improvement in design and operation. Inflation has increased the cost of new equipment as well as the price of product sales. Depreciation allowed on older equipment has not kept pace with cash for eventual use in replacement of machines and shortages of working capital can hamper the necessary acquisition of replacement equipment.

Why Leasing Is Attractive

A Dun and Bradstreet survey in July 1958 showed a general neglect in modernizing plants and equipment. One out of every four plants with some obsolete equipment estimated that production costs could be reduced by 10 percent or more if all obsolete facilities were replaced with up-to-date equipment. Among plants with 15 percent or more of obsolete facilities, 3 out of 8 would expect cost reductions of 10 percent or more through complete modernization. One third of all the plants which replied to the survey had some productive facilities that were obsolete. Why did they not modernize in the face of the ever-present problem of competition?

The reason was the inability to obtain necessary funds readily or cheaply enough. Financing is likely to be a big step for medium-size manufacturers. Usually this group has limited cash or borrowing resources and it finds equity financing difficult. Thus they postpone capital improvements. Sometimes they can go to the bank for funds; otherwise they must wait until their needs can be financed from reserves or through leasing. More and more companies are operating with capital not their own by leasing equipment. Company officials are fighting to conserve cash, regardless of fluctuations of the money mart. The trend will continue as long as wages and raw material costs push higher and while tax rates are steep and fail to decrease.

The lease method, providing cash flow advantages for companies which can use more working capital, may be better employed by many companies than other methods. The lease permits the lessee to pay as rent the cost of using the fixed assets. A long-term conditional sales contract may have this same advantage. The lease may provide increased cash flow in the early years of the asset life and additional working capital may be invested in more profitable projects. Rent payments are deductible as expense. Expenses are increased and, being deductible from income, result in tax payments decreasing—making more cash

available. On the other hand, cash payments to a vendor for equipment are not deductible, except through depreciation.

Some plans of leasing and purchasing may require the same outlay of funds but true costs may be different in each case, depending on how payments are arranged, mainly because of ability to use and invest working capital wisely and profitably. The plan which permits the largest postponement of payment will have the lowest cost because the sum of its required future payments has lowest present worth. When equipment or buildings are purchased, each year's use is prepaid, through depreciation. Under leasing, you pay only for the use of the asset while you need it. Free capital may be more profitably used in research and development, in expanding inventory, in increasing the size of the operations, in financing expanding receivables, or perhaps in supporting increased sales. Some large and some small companies are currently profiting from rental of tools and industrial office equipment. These are instances in which a large part of working capital is tied up in inventory or pressure is being exerted to promote new products and to expand sales. Profitable allocation of funds is becoming one of management's great headaches!

The situations in which leasing is used are diverse. For instance, consider a highway contractor who would have found it impossible to purchase new equipment needed to fulfill a long road building contract, since a cash purchase or debt financing would have reduced his working capital below what was required by the bonding company. Unless he leased the necessary equipment, he would not be in a position to fulfill the contract. Some companies that are classified as good credit risks use leasing as a supplement to bank credit to overcome some disadvantages of bank borrowing. Many companies have bank lines, yet lease. A company may be able to borrow all of its capital requirements from banks, so will find little cash flow advantage from a lease. However, a lease is frequently written for longer terms than those offered by bankers on loan repayment schedules. Again a company may wish to reserve the bank lines for normal operating needs, acquiring the use of assets with supplementary credit available through leasing or a company may feel that long-term debt would discourage new investors in its stock and make equity financing more difficult. Some financial officers explain that leasing enables them to remove fixed assets from balances sheets, thus avoiding stockholders' criticism on presumed over-expansion. Appearances of more liquidity may result from leasing, particularly as compared to notes payable under conditional sales contracts or bank loans, since leases do not generally appear as current or long-term liabilities.

Then there is the tax reduction "temptation" in an enterprise in which the proportion of long-lived machinery and equipment to other assets is large, the

fact that depreciation on cost is grossly insufficient eventually to replace equipment at current inflated values and that taxes must be paid on the resulting improperly exaggerated and declared income means that the funds which should have been saved to provide for the replacement and maintenance have been taken from the taxpayer by the government. This makes a taxpayer who uses a high proportion of long-lived machinery in his business chronically short of the funds necessary merely to keep him even, that is, to maintain his investment in workable productive property.

Tax advantages in leaseback arrangements are now found in leasing machinery and other equipment. Under a lease arrangement, you may charge off the rent as a business expense and this may amount to more than the recognized depreciation write-off on similar equipment. If terms of lease are shorter than the life of the plant as rated by the Internal Revenue Service, a company may enjoy a fast write-off benefit. However, primary emphasis should not be placed on leasing for presumed tax savings. Some still think of leasing in terms of tax saving but, actually, this only changes tax timing. Rental expense deductions in a lease may be standard over a period of years or may be largest in certain years. To the extent of such excess deductions, tax is reduced and more cash is available for alternative investment. A new lease should be executed only on a reduced monthly rate, as the lessor's cost of equipment, presumably, has been returned during the basic time of the lease. During a renewal period, the rental is generally reduced and taxes, therefore, are greater.

Those who can forecast economic and tax trends may look upon the lease with favor during periods when a general reduction in tax rates is expected. A lower rental rate over renewed leasing periods will produce more retained profit as taxes go down. Purchasing agents may see more advantages through leasing in a period when taxes are going up. Here the decision will be influenced by the estimated potentials of various alternatives proposed for freed capital. Practically, it seems wiser to eliminate any consideration of the tax rate when making a management decision concerning leasing or purchasing.

Word of warning must be given to would-be lessors if they want to get a full tax deduction. Since the Internal Revenue Service is out to eliminate the use of rentals as a tax "dodge," a contract is safer if the rates for use of equipment are specified on an hourly, daily or weekly basis. Examiners may challenge the expensing of rental payments of contracts if the contract permits the user to pay for equipment out of income from its use and then to apply the payments against the purchase price if desirable. They prefer the absence of an option to purchase or, if there is an option, one that bears no relationship to the amount

of rentals paid but only to the value of the leased equipment at the time of exercising the option.

Real Estate; Automotive Equipment

We have given consideration to rental of office and processing equipment. There is also the matter of real estate. Many favorable leasing deals are being effected by private individuals or companies with life insurance companies, holders of pension funds, real estate brokers, private investors and lease-back specialists, for large industrial companies. When considering such setups for smaller companies, a building site must be selected that is suitable to other types of business and a structure should be designed the use of which would not be too limited in the event things did not go well for the lessee. The motive for sale and leaseback of industrial property may be that money can be better utilized in expanded sales or that there is not enough money to purchase the property and to build facilities, too. Leasing may provide added working capital and still allow the use of a new plant. It also avoids more long-term debt for the lessee.

In some of these arrangements a plant may be built to specifications and sold. Today, there are companies in the business of purchasing property and renting it for specified periods, with three to four options of renewal. In such event, an amount of cash is realized by the seller through the sale of the property and the money payable by him thereafter as rent should be at a level which will, in effect, give the renter long-term financing at a rate he can afford. Leasing is now gaining a foothold in the automotive fields. Trucks leased and rented in 1956 were 225,000 or 2 percent of the ten million registered. Even this was double the 1955 figures. Ten years ago, only 25 percent of that number were leased. Truckers believe that leasing represents that industry's greatest area of potential expansion. Particularly advantageous to new companies is the fact that leasing eliminates the need of a heavy capital investment in trucks. Leasing also simplifies the drawing up of operating budgets, since transportation expenses for the year may be closely estimated at the beginning of the year. Under a straight leasing deal, there are no contingent costs. Being able to forecast vehicle costs accurately is a definite asset to truckers in their fiscal planning.

In September 1958, the Pennsylvania Power and Light Company sold its 3,000 vehicles for an estimated four million dollars and then leased them back on a monthly rental basis to reduce the vehicular fixed charges of the company by about $290,000 annually. The transaction was the first of its kind ever made by this utility, which provides electricity to 600,000 customers in 31 eastern counties. The company feels that the transaction has had the effect of giving it

four million dollars of permanent capital for general operating use and that it reduced by $175,000 the annual conventional carrying cost of such capital. Vehicles involved were passenger cars, trucks, trailers, mobile two-way radio equipment, locomotives, construction and earth-moving equipment.

Late in 1957, the Pennsylvania Railroad agreed to lease 225 diesel locomotives from Alco Products, Inc., a General Motors Corporation leasing subsidiary. Railroads normally purchase their equipment through the sale of ten to fifteen year equipment trust certificates. Leasing locomotives to a railroad is a highly uncommon undertaking. Freight car leasing is not unusual. General American Transportation Corporation, in addition to manufacturing and selling freight cars, leases these units to shippers and railroads. Among the various methods of determining rental payment are by the mile, the trip or by the month.

Where Else May Leasing Apply?

There are several additional areas in which leasing offers certain clear-cut advantages:

Contractual work—Companies taking on contracts for work requiring additional tooling may go to leasing in order to concentrate this element of cost in the contractual period. On completion of work, the equipment can be leased at nominal renewal rates if useful on other projects, or it may be returned to lessor. Some corporation officers feel that the rental expense is more acceptable to auditors on government contracts than is depreciation on owned fixed assets.

Technical obsolescence—In industries experiencing rapid technological progress, the ability to get up-to-date equipment and to return it promptly as it is released offers substantial influence on a choice between leasing and purchasing. Short basic leasing terms, averaging three to five years, facilitate the forecast of equipment earnings against equipment costs. With industry technology changing rapidly, leasing may be preferred to the greater risk of projecting forecasts over longer periods of years, which would be required by purchase and depreciation of the same assets.

Hedges against inflation—To the extent that the term of the basic lease is shorter than government-allowed depreciation of similar assets, the lease may act as a hedge against inflation. Money is received sooner under leasing. Money thus available is invested in new equipment. Cost of rental rate covering new equipment is lower than it may be at a future date if inflation continues the devaluation of the dollar.

Economic forecasting—When a company can project future sales accurately enough to use the forecast for long-term planning of sales

and production, leasing may offer an advantage through concentrating heavier basic lease payments in the years of high profit expectation. This reduces the risk inherent in longer forecasts based on regular depreciation periods.

Severe usage—Some manufacturers have to use equipment under severe conditions with multiple shifts, dusty atmosphere or outdoor operations. To such users, leasing may be attractive because any worn equipment can be replaced with a new model at the expiration of a lease. Leasing allows the use of new, up-to-date equipment, whereas ownership tends to keep equipment in operation as long as possible to avoid the capital expense of replacement.

A Growing Field, But Is It for You?

In conclusion, a warning might be given that leasing should not be adopted merely because a company is big or because it is small, nor merely because taxes can be avoided by so doing, nor merely because there is an interest in large or small equipment. Leasing should be adopted because of the anticipation of a better return on investment rather than through a desire to defeat depreciation allowances. Leasing should neither be employed because it may be cheaper nor be avoided because it is more expensive. Each situation should be studied from all angles before the final decision is made.

One authority estimated that in 1953 the total amount of capital equipment under lease was about $450 million. A comparable figure in 1958 was thought to be about $1.5 billion. This indicates that leasing is growing at a tremendous rate and the probability is that it will grow at an even faster rate. Looking ten to fifteen years ahead, many feel that most businesses will be operating with some portions of plant or equipment acquired through leasing or through installment credit, although the trend might be affected by changes in federal tax rates or regulations or in rulings on depreciation.

Choosing an Incentive Plan for Supervisory and Clerical Employees

by PAUL W. DEMAREST

ANY INCENTIVE COMPENSATION PLAN has attractive features for both the employer and the employee. The latter, through the incentive plan, supplements his income by his efforts to increase his company's profit. In addition, deferred income plans provide security for retirement and, in some cases, definite income tax savings. The employer gains from an incentive plan by retaining valuable employees and cutting his turnover of top management. There is also a definite tax savings to companies using such plans and there is the immeasurable advantage of increased performance by employees included. The best incentive compensation plan would provide participating employees with substantial current earnings, security for retirement and maximum tax savings. There is no single plan that covers all of these desired benefits. A combination of several plans is needed to meet all requirements. The incentive program to be adopted by any company is also limited by its financial strength and the number or types of employees to be included under the plan.

The first consideration before setting up any specified income plan for members is to review the financial condition or potential of the company. Obviously, the most desirable condition would be a concern with a lengthy record of consistently high earnings. The two most common types of employee incentives, deferred income and pension plans, are considerably affected by the companies' earnings picture. The deferred income plan is considerably more popular today because payments are required only when the company makes a profit. Pension plans require fixed payments regardless of the profit results.

The method of paying out benefits for an incentive program must be selected in advance and submitted for approval by the tax authorities. The most commonly used type of program is that in which a fixed percentage of the company's profits is paid into the program after deducting a predetermined amount for dividends, taxes and surplus reserve. An example would be a company in which the Canadian and U. S. income taxes average 50 percent of

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income, the required dividends of preferred and common stock amount to $9,000,000 and the surplus reserves are $1,000,000. In order for there to be any payments into an incentive program, this company would require a net income before taxes of over $20,000,000. Other methods of payment include a sliding scale of percentages increasing with the amount of profit. This arrangement has the advantage that maximum payments are paid into an incentive plan in those periods of high income when the company can afford them. Still other systems include limiting the incentive plan contribution to a fixed percentage of payroll and a maximum amount including or excluding credit carryover.

Employee Eligibility; Tax Qualification of Plan

Once a satisfactory financial strength has been recognized, we must then determine what classes of employees are to be included under the incentive program. We should eliminate part-time employees. This is permitted by the tax authorities. Part-time employees are generally defined as those working less than 24 hours a week or five months a year. Hourly employees represent the largest group to be considered. They are covered almost entirely by union contracts. In the Fruehauf Trailer Company, hourly employees account for about 6,500 of the 10,200 employees in the system. Tax laws permit the exclusion of hourly employees from profit sharing plans. I think we can rightly assume that the union man's main interests are in high base rates paid currently rather than any bonus plans, particularly deferred plans.

Our next question is what portion of the salaried and clerical employees should be included in our plan. Tax laws permit the exclusion of employees earning under the social security base of $4,200. Benefits may also be varied according to amounts earned above or below the $4,200 base. I would recommend that salaried and clerical employees all be included in this plan. I would determine the employees' shares on their annual base rate earnings. By including clerical employees in our program we can also accomplish tax savings. If we adopt deferred profit sharing methods, tax regulations require inclusion of 70 percent of eligible employees. This would mean, in many cases, that clerical employees would have to be included in the company's plan.

Once we have decided what employees are eligible for an incentive plan, the type of plan must then be determined. The plan we are proposing takes into account the varied desired of the participants. In the salaried and clerical group, the executive employees are most interested in a plan which would reduce their taxes and provide security after retirement. The junior executive and lower echelon of employees are really more interested in immediate cash

return rather than long-run tax savings or retirement program. Of importance to any incentive program is the manner in which it will be distributed to the participants. The following methods are currently used in active programs:

1. Each member's share is determined by the ratio of his earnings to the total eligible earnings.
2. Another measure may be used, such as hours worked or units of production or sales by each participant to the total for all participants.
3. Additional credits may be given to employees with considerable length of service, on a point system.
4. The plan must also have detailed listings of how member credits are accumulated and what disposition is made of the participant's interest on retirement, death, disability, termination or even distribution during active employment.

There is also the question of qualification of a plan under the Internal Reveue Code. To qualify, i.e. for contributions to be deductible on the company's Federal tax return, for any deferred income trust fund plan, the tax authorities have established, by regulations, these conditions:

1. Payments by the employer into the fund can at no time exceed 15 percent of the annual earnings of the participants. However, there is a carryover provision for those years in which the profit is less than 15 percent of the earnings of the qualified members in the plan.
2. The trust agreement with the employees must be in writing and it is advisable, although not required, that a definite formula for determining the share of the company's profits to be distributed be set up in advance.
3. The trust further must have rules as to when and how the benefits will be distributed to participating employees.
4. In order to gain the tax benefits of such a plan, it cannot favor the higher paid employees in the organization. The most recent tax rules indicate that 70 percent of the eligible employees not only can but must participate for the plan to be qualified.
5. The details of any plan must be made available to company employees.
6. The trust agreement has to be irrevocable and must be set up for the benefit of the employees only.

The Plan in Detail

Because all levels of employees are to be in this program, we have selected a plan not identical to any present program we reviewed but really a com-

promise of several types. It provides for payments to employees within a reasonable length of time after the start of the program. It also withholds a portion of the profits paid until the employee retires, dies or resigns due to ill health. Conditions of eligibility are lenient to give broad coverage in the salaried employee group. The plan we suggest is shown by the following example. Advantages and disadvantages of all types of programs will be discussed later in this article.

Suggested Employee's Deferred Income Trust Fund Plan

	Employee's Share		*Cash Payments to Employees*		
Years of Operation	*Per Year*	*Cumulative*	*Per Year*	*Cumulative*	*Retirement Fund*
1st	$1,000	$1,000	$ –0–	$ –0–	$ –0–
2nd	–0–	1,000	–0–	–0–	–0–
3rd	100	1,100	220	220	880
4th	1,800	2,900	536	756	2,144
5th	500	3,400	529	1,285	2,115
6th	200	3,600	463	1,748	1,852
7th	–0–	3,600	370	2,118	1,482
8th	1,000	4,600	496	2,614	1,986
9th	200	4,800	437	3,051	1,749
10th	700	5,500	490	3,541	1,959
Total	$5,500		$3,541		

Details of our proposed plan are as follows:

1. The simplest method of operation is selected, i.e., to invest the employee's share shown in our example in a trust fund.
2. Income on funds held for the employees is not subject to income tax.
3. The cash payment base used in the above example was 20 percent of the unpaid balance per year. This could be varied.
4. We would suggest employees become eligible after one year's continuous service with the company. Tax laws permit a five-year service requirement.
5. Payments would start in the third year after entering the plan.
6. The plan must be continuous.
7. Anyone leaving the company for reasons other than retirement or death would forfeit all rights.
8. The amount to be paid into the plan each year would be distributed to employees on the ratio of their gross earnings (exclud-

ing overtime and other premiums) to total earnings of eligible employees.

9. Each employee would get an annual statement of this account.
10. Benefits from such a program on retirement may be taken as capital gains rather than income if desired.

Comparison With Other Incentive Media

The advantages of this deferred income plan should be compared with all other types of extra or incentive compensation plans. The possibilities seem to be:

1. Pay increases (straight salaries with fixed rate ranges)
2. Tax free compensation
3. Deferred pay
4. Stock plant
   a. Stock bonus (outright gift)
   b. Stock purchase (less than market)
   c. Stock option (savings toward price at less than market)
5. Profit sharing
   a. Cash bonus
   b. Deferred
6. Pension and annuities
7. Life insurance
8. Fringe benefits
   a. Sick pay
   b. Company subsidized restaurants
   c. Rooming facilities
   d. Medical examinations
   e. Home financing
   f. Free vacations
   g. Recreational facilities
   h. Company owned resorts
   i. Educational opportunities

Pay increases, which are given when business conditions permit, produce the problem of high fixed cost when business conditions are poor. For this reason, some other form of compensation over and above normal rate ranges is desirable. Tax free compensation is still subject to legal question and would not be practical for large groups of employees. Deferred pay plans are primarily for executives, to avoid high income taxes. The deferred pay usually comes after retirement. Therefore, this plan is limited in its coverage. Stock plans for any sizeable group of employees would tend to "water" the stock of the company. Here again, the executives would be the group primarily interested in such a program.

A profit-sharing cash bonus has the advantage, theoretically at least, of increasing output on production concurrently with payments. The disadvantages of a cash bonus program are that it will not avoid any income taxes and it does not tend to encourage the employees to stay with the company. Deferred profit-sharing plans can be on a cash basis or on a trust fund basis. This is the type

of plan suggested in this report. Pension and annuities differ from profit-sharing programs in that the payments are fixed regardless of business conditions. For this reason, they are less advantageous to a company for which margin of profit varies considerably. It is likewise true that pension and annuities are of least interest to the younger and lower paid employees.

There are several types of insurance which can be used as employee incentives. The first is group term insurance currently used by the Fruehauf Trailer Company. In addition, there are programs of individual life insurance contracts with executives, primarily, as well as split dollar insurance. This latter deserve special consideration, particularly in the cases of executive compensation programs. These programs operate in the following manner and have certain benefits:

1. Either the company or the employee takes out an insurance policy on the employee's life.
2. In the event of the employee's death, the employer is named the beneficiary for the amount of the cash surrender value or the portion of the premiums paid by the employer.
3. The employee pays the portion of the annual premium above the increase in cash surrender value, which is paid by the company.
4. If the insurance is terminated for any reason other than death of the employee, the company usually gets the cash surrender value and the employee would receive nothing.

BENEFITS TO EMPLOYEE

1. The employee is covered with a larger amount of insurance than he would ordinarily afford, during a period of life when maximum coverage is needed.
2. The comparative costs between split dollar insurance and group insurance over an estimated period are $1.60 per thousand coverage on split dollar programs and $7.20 per thousand on group programs.
3. Split dollar insurance can remain effective after retirement, which is not true of group insurance.
4. Whenever the employee leaves his job, he can continue the insurance.
5. Payments by the company for the employee are not taxable.

BENEFITS TO EMPLOYER

1. There is little, if any, cost to the company.
2. The employee is encouraged to stay with the company because of the forfeiture provision.

3. When the employee retires, the benefits of the insurance program may be used to finance pension or other such programs.
4. For executives in the high income tax brackets, split dollar insurance is of extreme benefit as non-taxable income. Accumulation of funds for split dollar insurance is not subject to surplus penalty surtaxes.

Fringe benefits, including sick pay, medical examinations, a company-owned resort and educational opportunities are already provided by our company to all, or at least a considerable portion, of salaried and clerical employees. Objections to fringe benefits being expanded further include:

1. They tend to favor executives.
2. They smack of paternalism.
3. They represent fixed costs in good or bad economic conditions.

Summing Up

We conclude that the best overall type of incentive compensation plan at this time is the deferred profit sharing trust plan described. The company is the sole contributor but the plan holds a double-barreled incentive—annual cash payments plus a retirement fund. The coverage recommended is broad. In brief, the plan should stand up as a worthwhile incentive, supportable out of present profits and capable of stimulating future profits.

Leasing of Machine Tools

by HARRISON A. BAUSCHER*

MANY of the capital equipment manufacturers have found that leasing of machine tools has offered a greater stability of income to their operations. This can be a marked advantage to a feast-or-famine industry. There can be a slump in business, but the rental income from previous year's sales can help equalize the profit. It can also help the cash position and equalize the tax payments. The lessor or seller can also gain a side benefit because a leased machine in a lessee's plant can pave the way for future sale of accessories or additional equipment. The machine can also be tried out with less expense to the lessee. If it is unsatisfactory, the machine can be returned; and if it proves satisfactory, the lessor has a good foot-hold for future orders.

Most tool-lease machines are of the standard type because, if a machine is returned to the lessor, it can readily be renovated and sold as a used machine or re-leased to a new customer. A good solid tool-lease program can help promote business, besides causing a flow of inventory and producing a steady net income after depreciation rates are taken. Each machine sold should have a separate lease contract and should be sold to reliably established companies and not to marginal risk ones.

The program also has its advantages to the lessee. It permits him to modernize his plant with less capital, or the existing capital can be diverted into more profitable purposes. The newer and better equipment can help production costs which, in turn, helps the profit. The leasing costs, or rental, can be charged off as current expense, such as depreciation would. This, in turn, would help equalize the profits derived from the better production costs. The leased machines would not need the maintenance and repairs that older machines would require. If the option on a leased machine is not taken up by the lessee, he avoids the risk of high obsolescence at a later date. This allows him to maintain high standards of efficiency and capacity without a high investment.

The greatest disadvantage in leasing is the possible legal and tax problem. The lessor feels obligated to bring it to the attention of the lessee. Generally, the inclusion of the option-to-purchase clause in a lease contract may bring up a tax question at a later date as to whether it is a bona fide lease or just a conditional sale. Under a

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conditional sale, the rental payments would not be tax deductible and any tax advantage would be lost. Usually a lessee insists on the option to purchase.

There are many kinds of leases used. The three types we use are for a term of seven years. They vary only in the options offered. The lessee may either purchase the equipment or terminate his lease at the end of the first, second or third year. Payments are usually semi-annual in advance. The customer must maintain the leased equipment in good operating condition and can usually operate the equipment as much as he desires. The equipment should be used in the plant specified in the agreement and the customer should pay for parts and service just as if he owned the machine. Hazard insurance should be carried for the full value and the freight and installation charges should be paid by the customer.

In leasing its products to its customers, the machine tool industry is only utilizing a sales tool which has been used by other industries for some time. For example, companies rent fleets of cars, trucks, trailers, construction equipment. Bus companies even lease tires.

The paper work, from the accountant's standpoint, consists of collecting the lease payments, carrying the equipment on the books as an asset, and depreciating it for tax purposes, if rental does not stand up as a tax deduction.

An Accountant's Reflections on New Thinking on Marketing

by MICHAEL SCHIFF*

MARKETING literature is replete with references to the *new* "marketing concept." The origin of the phrase is attributed to the General Electric Company and its initial presentation in that company's 1952 annual report to stockholders. The new concept:

> "Introduces the marketing man at the beginning rather than at the end of the productive cycle and integrates marketing into each phase of the business. Thus, marketing, through its studies and research will establish for the engineer, the designer, and the manufacturing man what the customer wants in a given product; what prices he is willing to pay and where and when it will be wanted. Marketing would have authority in product planning, product scheduling, and inventory control as well as in the sales, distribution and servicing of the product."

A significant number of companies have adopted this extended scope of marketing management as is evident from recent surveys (See *Sales Management,* November 21, 1958). The cost accountant and analyst can ill afford to ignore this significant change. This is especially true since the bulk of the industrial accountant's activity has been related to the manufacturing phase of the business. His contribution in this area has been significant and will continue to be so. However, the emphasis on marketing and the expanded functions related to marketing require an increasing amount of the accountant's attention as well as his ability to develop new and more refined analyses to aid marketing management in meeting its important new challenge.

The Accountant and Marketing Costs

It might be said that the accountant has responded to the extended needs of marketing management in a significant way. Real progress has been made in developing analyses of marketing costs as they relate to profitability of products, customers, salesmen, channels of distribution and in the control of specific marketing functions. In passing, it is well to note that evidence of this progress is sensed only through personal contacts and rather fragmentary reports. It is significant that, despite the sharp in-

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crease in the amount of expenditures for marketing operations and the increased significance of the marketing function, there are but two texts available and comparatively few articles published on industry experience and experiment on new methods in this vital field. It would certainly help if we knew more of current developments. This also suggests that there is room for innovation in the approach to analysis and control of costs related to the marketing function.

The Sales District as a Long Life Asset

One area that might be explored is the very nature of the sales district or territory. Traditionally costs related to the development of a sales district are treated as period costs. By way of contrast, the costs of acquiring buildings, machinery, and equipment are capitalized in accepted accounting treatment. What is more relevant is the amount of time and effort devoted to planning, maintaining and control of the activities related to long-life assets. Just think of the steps involved before a company makes a substantial investment in long-life assets—the search for capital expenditure proposals, the careful evaluation measuring outlay against projected return via pay-back period, discounted cash flow or some other measure; the detailed specification of a capital budget and the control of outlays until completed; the post-completion audit; the well-developed flexible budget to measure utilization — actual against planned and the extended analysis of volume or capacity variance. These have proven to be sound and effective as a means for controlling parts of the manufacturing operation, with some infrequent reference to marketing when analyzing causes for volume variance.

It is suggested that the sales district or territory has many of the qualities of a long-life asset. The development of a sales district involves costs not unlike costs which go into any other long-life asset. These costs of entry into a new market are future costs and are expended with a view to revenue to be secured in the future. The fact that there is no tangible physical evidence of the existence of a district is not significant at all.

Capitalizing the value of a sales district for internal accounting and control purposes would put cost and revenues relating to the district in clearer focus, thus facilitating evaluation of performance in a realistic way. Finally, it would provide a guide to gauging expansion, intensive or extensive, using the very same financial management tools employed in evaluating plant expansion. It would certainly be a step in the direction of recognizing that marketing costs are incurred for the production of revenue as are factory costs.

Of course, there are many problems to be faced in fully implementing this concept. These include questions as to the costs to be capitalized in entering a new market as well as capitalization rates for existing sales districts so that effective comparisons can be made. The challenge posed by these questions should not deter one from trying.

The Salesman and Return on Investment

The approach in evaluating performance of salesmen geared to return on investment has been tried with a degree of success. Some of us still struggle with the problem of convincing management that salesmen's performance and, therefore, compensation should be geared to profit rather than volume. The emphasis on profit is part of the currently popular "marketing concept." The need is to go a further step in stressing that profits alone should not be the sole basis for evaluating performance. The salesman, in making sales which produce profits, ties up varying amounts of capital in the inventory necessary to sustain his sales as well as in accounts receivable generated by his sales. Accordingly, it is suggested that performance be based upon return on investment using the accepted formulas:

$$\frac{\text{Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}} = \text{Return}$$

For this purpose the terms would be defined as follows:

Income: Sales less standard manufacturing cost and direct marketing costs associated with the specific salesman.

Sales: Sales produced by the salesman.

Investment: Inventory and accounts receivable associated with this salesman's sales.

The high cost of capital and the many alternative uses available to management call for as much control on investment or assets employed in connection with a salesman's activities as is currently exercised on sales and profit.

Sales Volume Performance

Typically, the sales forecast is the beginning of the budget process. Whatever methods of forecasting employed may be in use, the sales goal is arrived at and from this flows the production, purchasing, financial and other budgets for an operation. The performance of the sales force is generally related to a quota derived from the sales budget and deviations are carefully studied. Compensation schemes are frequently built upon the idea that incentive payments are in order for sales or better still profit contribution over quota.

This, it is suggested, is an oversimplification, as can be illustrated by assuming that the forecast of sales was 100 and actual sales were 80.

The variance of 20 would represent a failure in achievement. Conversely, sales at 120 would suggest a better than planned performance. This has to be refined. The question is, how adequate was the forecast! If we assume that specific economic indicators appropriately weighted were used to arrive at the forecast of 100, does it not follow that, before actual performance is evaluated, the forecast should be modified in the light of the known economic conditions at the time the evaluation is made. Since the comparison is historical, we can perhaps modify the forecast in the light of known economic data and relate this revised forecast to actual performance. If we assume that the revised forecast was 88, the original forecast 100 and the actual sales 80, then the sales variance is 8 and the forecast variance is 12. (Exhibit 1)

The reader will note that this is but a variation of the technique employed in deriving variances from a flexible manufacturing overhead budget. It permits a clearer definition of cause for variance from expected sales and, therefore, a more effective

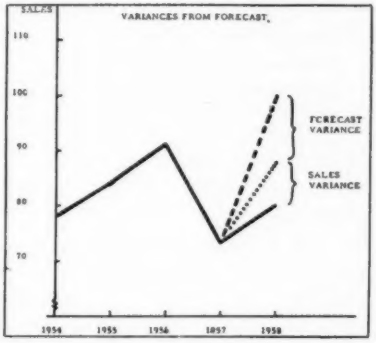

EXHIBIT 1

association of responsibility with variance. Finally, it might serve to sharpen techniques employed in forecasting.

These are but a few suggestions on what is being done and some thoughts on what might be done in developing better tools for use by marketing managers. The opportunities for the accountant are enormous and the creative job waits to be done.

Beyond these Covers

Books

Dynamic Management Decision Games

Jay R. Greene & Roger L. Sisson, John Wiley & Sons, 440 Fourth Avenue, New York, N. Y., Paper Bound, 1959, 84 pp., $2.95.

Seven "noncomputer games" are included in this presentation, preceded by three chapters on the value, construction and direction of decision games. The problems tackled in the games given are from the fields of inventory, personnel, retailing, production scheduling, sales and correlation of marketing and production. Player and referee instructions are included with each game.

Wholesaling

Beckman, Engle and Buzzell, Ronald Press, 15 East 26th Street, New York 10, N. Y., Third Edition, 1959, 705 pp., $18.

A book on a line (or stratum) of business, this work, originally issued in 1957, has ample contents as to nature, practices, extent, origins, history and other features of wholesaling. It is not an accounting text but is excellent background for individuals in any phase of wholesale company management.

Marketing and Distribution Research

Lyndon O. Brown, Ronald Press, 15 East 26th Street, New York 10, N. Y., Third Edition, 1959, 561 pp., $7.

The marketing activity is drawing more and more attention from accountants. This comprehensive new edition introduces new chapters on sampling in researching market potentials. The book ranks as background reading in an important business field.

S.E.C. Accounting Practice and Procedure

Louis H. Rappaport, Ronald Press, 15 East 26th Street, New York 10, N. Y., Revised, 1959, 555 pp., $15.

A specialist in the field written on, the author of this work has up-dated the original issue (1956). Attention is given to cases which have influenced the rules to which companies must conform in registering with the commission. These include the McKesson & Robbins, Kaiser-Frazer and Interstate Hosiery cases.

Illustration of Management Accounts in Practice

A. G. B. Burney, Gee & Company, 27 Basinghall St., London EC2, England, 1959, 126 pp.

In this small book, management accounting appears as a specialty of growing importance. Of the two parts of the volume, the first describes and illustrates statements of use to management, including departmental and branch statements, as well as a cash forecast and "movement of funds" statement. The second part of the book is also both descriptive and illustrative, this time of accounts, standards and budgets needed to underlie the information desired.

How and Where to Look It Up

Robert W. Murphey, McGraw-Hill Book Co., 330 West 42nd Street, New York 36, N. Y., 1958, 720 pp., $15.

This work is subtitled as "a guide to standard sources of information and is not an accounting or business work as such but covers sources in all fields." However, accounting references appear in the index (with several listings grouped together on page 313) and such groupings as business and manufacturing, mathematics, and trade and commerce are utilized in the listings.

Evaluation of Operations by Management

R. G. Lochiel and others, The Controller, August 1959.

A broad case study of airline operations, prepared by four officials of the company, attention is given in this paper through text and accompanying charts to the many facets of operations which may be formulated for evaluation. Random citations of these data topics are "station delays," "revenue variance," "revenue and expense per mile," "fuel cost" and employee productivity.

Effective Administration of a Marketing Research Department

Harry Deane Wolfe, The Controller, August 1959.

First of all an article on the work of market research and the general principles of how to do it well, this article also introduces the needs for and scope of budgeting of market research costs. Three reports relating to out-of-pocket cost reporting for research and dealing with products and projects, are given.

Planning for Profit Improvement

Gerald G. Fisch, Cost and Management, July-August 1959.

Illustrated by three charts—"The Perpetual Planning Cycle," "Parameters of Perpetual Optimum Profit Achievement and Growth" and "Functions of a Manufacturing Company"—this presentation proceeds upon the thesis that through-going planning is now a necessity rather than a choice for company progress and survival. A closing comment is that, "Effective results require accurate and fairly complete information, good judgment and technical competence in setting objectives and developing plans, accurate and timely feedback, and effective leadership."

Accounting Problems in the Construction Industry

LeRoy H. Cole, The Arthur Young Journal.

The many variables and uncertainties which affect contract accounting, the types of contracts, and recognized methods of accounting for profits are dealt with compactly by the author of this article. He considers also tax factors and general and administrative expenses, which some contractors charge to contracts.

The Development of a Maintenance Control Program

Charles H. Waldmann, Systems & Procedures, August 1959.

A metal company case study, there is described in this article an investigation into maintenance practice ("pointed questions" and "blunt answers"), a report of finding, and development of controls. It is stated that "Departments and plants benefited throughout because of the development of means of relating organizational structures and numbers and types of personnel to the amount of maintenance work line."

ADDRESSES OF PERIODICALS

The Controller
2 Park Avenue
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